OPERATION & MAINTENANCE PLAN

CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE
OPERABLE UNIT 2
333 HAMILTON BOULEVARD
SOUTH PLAINFIELD, NJ 07080-3310

FEBRUARY 2014 VERSION

356102

Operation and Maintenance Plan
Cornell-Dubilier Electronics Superfund Site

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1.0 INTRODUCTION

This Operation and Maintenance (O&M) Plan is follow-on work to the Remedial Actions (RA) completed at the Cornell-Dubilier Electronics Superfund Site, Operable Unit 2 (Site). The RA was performed pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, ("CERCLA"), and in accordance with the Record of Decision (ROD) for Operable Unit 2 (OU2). The ROD was signed by the United States Environmental Protection Agency (EPA) in September 2004. EPA Region II is the lead agency performing the work at the Site, and the Remedial Project Manager is the main Point of Contact (POC) for O&M at the Site.

This O&M Plan includes the operation and maintenance of the following primary site systems and components installed as part of RA restoration at the Site:

- Stormwater Retention Basin
  - The stormwater retention basin includes all conveyance piping, collection system structures, sand filter systems, and features collectively to manage stormwater runoff at the site in accordance with NJDEP regulatory requirements.

- Pavement Cap
  - The Pavement Cap includes approximately 23 acre bituminous pavement serving as an engineered cap, in accordance with the OU2 ROD.

- Miscellaneous Site Maintenance
  - Site access control features including perimeter fencing and gates and warning signage. Also includes sidewalk snow removal, vegetation and weed control, trash and debris removal, and general housekeeping.

This O&M Plan documents the strategy to address the O&M regulatory requirements for the stormwater management measures as required by NJDEP, and includes O&M for the other site features summarized above. This plan is required by N.J.A.C. 7:8 Stormwater Management Rules and contains the required elements described in the NJDEP Stormwater BMP Manual, Chapter 8 – Maintenance and Retrofit of Stormwater Management Measures and Chapter 9.9 Standard for Sand Filters. This plan also addresses the inspection routine and long term maintenance required for the Pavement and site maintenance. This O&M Plan contains specific preventative and corrective maintenance tasks, schedules, and the name, address, and telephone number of the EPA Point of Contact responsible for the site maintenance.

1.1 STORMWATER MANAGEMENT MEASURES

According to the NJDEP Stormwater Management Rules, all maintenance plans for stormwater management measures must include the following items as addressed in this maintenance plan:

- The contact information of the person(s) responsible for the preventative and corrective maintenance of the stormwater management measure.
  <u>Refer to Appendix E - POC information.</u>

- Specific preventative and corrective maintenance tasks such as:
  - Removal of sediment, trash, and debris;
  - Mowing, pruning, and restoration of vegetation;
  - Inspecting for erosion and restoration of eroded areas;
  - Elimination of mosquito breeding habitats;
  - Control of aquatic vegetation;
  - Repair or replacement of damaged or deteriorated components.

  <u>Refer to Section 2</u>

- A schedule of regular inspections and tasks, including detailed inspection tasks and schedules for the structural stormwater management measures.
  <u>Refer to Table 1 – Scheduled Maintenance Schedule</u>

- Detailed logs of all preventative and corrective maintenance performed at the stormwater management measure, including all maintenance-related work performed.
  <u>Refer to Appendix D - Example Field Report forms.</u>

In addition, as suggested by the NJDEP Stormwater Management Facility Maintenance Manual, the following items are also included in the maintenance plan:

- Recommended corrective responses to various emergency conditions that may be encountered at the stormwater management measure.
  <u>Refer to Section 2</u>

- Site Specific Health and Safety Plan (SSHASP). Procedures and equipment required to protect the safety of inspection and maintenance personnel. *TO BE PROVIDED BY O&M CONTRACTOR*.

- Approved disposal or recycling sites and procedures for sediment, trash, debris, and other material removed from the measure during maintenance operations. *TO BE DETERMINED BY O&M CONTRACTOR.*
- As-built construction plans of the stormwater management measure and copies of pertinent construction documents such as laboratory test results, permits, and completion certificates.
  Refer to Appendix C- Basin Record Drawings.

2.0 MAINTENANCE

As required by the NJDEP Stormwater Management Rules, this Plan addresses the site-specific maintenance plans for stormwater management measures, as listed in Table 1 and 2, and includes the following items:

- Scheduled Maintenance - preventative and corrective maintenance tasks, including:
  - Removal of sediment, trash, and debris;
  - Mowing, pruning, and removal of vegetation;
  - Inspecting for erosion;
  - Elimination and/or treatment of mosquito breeding habitats;
  - Control of aquatic vegetation;
  - Pavement inspections, crack sealing, and seal coating

- Unscheduled Maintenance - corrective maintenance tasks, including:
  - Removal and replacement of clogged filter material
  - Restoration of eroded areas
  - Repair or replacement of damaged or deteriorated components

This section also addresses the following topics:

- Recommended corrective responses to various emergency conditions that may be encountered at the stormwater management measure.

2.1 BASIN MAINTENANCE

This O&M Plan documents primarily the maintenance regulatory requirements for the stormwater management measures for the Site as required by NJDEP. The creation of this plan is required by N.J.A.C. 7:8 Stormwater Management Rules and this O&M Plan contains all of the required elements described in the NJDEP Stormwater BMP Manual, Chapter 8 – Maintenance and Retrofit of Stormwater Management Measures and Chapter 9.9 Standard for Sand Filters.

As implied by their name, stormwater management measures are expected to become the repositories for sediment, nutrients, trash, debris, and other pollutants targeted by the NJDEP Stormwater Management Rules. For this reason, stormwater management measures share maintenance requirements related to the other remedial controls of the Site including the Pavement Cap and drainage structures, all of which require regular inspection and cleaning, sediment and debris removal, and periodic replacement and/or repairs.

Research and experience have demonstrated that regular and thorough maintenance is necessary for stormwater management measures to perform effectively and reliably. They have also demonstrated that failure to perform such maintenance can lead to diminished performance, deterioration, and failure, in addition to a range of health and safety problems including mosquito breeding, vermin, and the potential for drowning. The potential for such problems to develop is accentuated by many of the very features and characteristics that allow stormwater management measures to do their job, including standing or slowing moving water, dense vegetation, forebays, trash racks, dams, and the need to continually function in all types of weather.

In recognition of these needs and potential problems, the NJDEP Stormwater Management Rules require that an O&M Plan be developed for all stormwater management measures incorporated into the design of a major development. Preparation of a an O&M Plan is an administrative requirement, and under CERCLA Section 121(e)(1), a Superfund response action need only comply with substantive, not administrative, requirements. However, EPA may elect to participate in a "permit equivalency" process, as a means of determining compliance with the substantive requirements of a permitting program. This O&M Plan has been prepared in accordance with the permit equivalency process.

The stormwater management measures defined as the Basin system for the Site consists of the following components. These components are illustrated on the Basin Record Drawings located in <u>Appendix C.</u>

- Stormwater collection system
    - 23 Catch Basins
    - 5 Inlet Structures
- Stormwater Detention Basin
    - Eastern Forebay
    - Western Forebay
    - Surface Sand Filter – Center
    - Orifice Outlet Structure
    - Secondary Outlet Structure
    - Emergency Spillway

As described in Chapter 8 of the NJDEP Stormwater BMP Manual, sand filters are normally used to remove relatively large amounts of sediments, metals, hydrocarbons, and floatables from stormwater runoff. Sand filters use solids settling, filtering, and adsorption processes to reduce pollutant concentrations in stormwater. The NJDEP adopted total suspended solids ("TSS") removal rate for sand filters is 80 percent. At this Site, runoff entering the sand filter is conveyed first through the eastern and western forebays, which removes trash, debris, and coarse sediment, and is then conveyed through the forebay / sand filter transition structure and into the surface sand filter bed located in the center. The treated stormwater then exits through the orifice outlet structure and the secondary outlet structure.

Sand filters are normally used in highly impervious areas with relatively high TSS, heavy metal, and hydrocarbon loadings such as roads, driveways, drive-up lanes, parking lots, and urban areas.

As required by NJDEP, a sand filter must have a maintenance plan and, should be protected by easement, deed restriction, ordinance, or other legal measures that prevent its neglect, adverse alteration, and removal. Because this work is being performed pursuant CERCLA, EPA will implement institutional controls to protect and maintain the stormwater management measures for the Site.

An emergency action plan for the spillway is not required as it is not a Class I or II Dam as defined in the NJDEP Dam Safety Standards at N.J.A.C.

2.1.1 Drain Time Inspections

Sufficient total temporary storage volume is provided within the forebay and sand bed zones (including the sand bed itself) to contain the design runoff volume and direct it through the sand bed without overflow. The design thickness of the sand bed provides adequate pollutant removal, while the bed's permeability or infiltration rate must drain the stored runoff to the top of the sand bed within 72 hours, as required by NJDEP Stormwater BMP Manual, Table 9.9-1. In addition, the capacity of the sand bed underdrain geotextile must allow the sand bed to drain freely, while the overflow must safely convey the runoff from storms greater than the design storm. The calculated normal drain or drawdown time for the Site's sand filter is 21 hours. Backup calculations are included in Appendix A.

The sand filter's normal drain (or drawdown) time is used to evaluate the filter's actual performance. If significant increases or decreases in the normal drain time are observed, the filter's sand bed, underdrain system, and tailwater levels must be evaluated and appropriate measures taken in order to comply with the maximum drain time requirements set by NJDEP and to maintain the proper functioning of the filter.

As required by NJDEP, twice a year the basin's drain time shall be inspected and monitored after a storm event which meets the design criteria of 1.25 inches in 2 hours, as measured at the nearest rain gauge, currently the Middlesex USGS unheated rain gage 403506074302801. Beginning 16 hours after such a storm event, the water level shall be observed every 2 hours until it drops below the top of the sand layer. The approximate time that occurs shall be noted and compared to the normal drain time of 21 hours. Any variance of 20% or greater is cause for the filter's sand bed, underdrain system, and/or tailwater levels to be evaluated. The infiltration rate of the sand bed material may also be retested. If the water fails to infiltrate 72 hours after the end of the stormwater quality design storm, corrective measures shall be taken by performing unscheduled maintenance to further investigate and mitigate any localized flow reductions.

Refer to Table 1 – Scheduled Maintenance Schedule.

2.1.2 Debris, Trash, and Sediment Removal and Inspections (Scheduled and Unscheduled)

As required by NJDEP, all sand filter components expected to receive and/or trap debris and sediment shall be inspected for clogging and excessive debris and sediment accumulation at least four times annually as well as after every storm exceeding 1 inch of rainfall. These inspection and removal activities are considered scheduled and unscheduled events on the operation and maintenance schedule (refer to Tables 1 and 2).

The inspection components include inlets, diversion structures, forebays, sand beds, and overflows. Sediment removal shall take place when all runoff has drained from the sand bed and the sand is reasonably dry. Disposal of debris, trash, sediment, and other waste material shall be at a EPA-approved landfill which is in compliance with all applicable local, state, and federal waste regulations. Disposal documentation shall be included with the field report from each event.

Inspection and elimination or treatment of mosquito breeding habitat shall be performed during the quarterly events if necessary, except during winter. The mosquito habitat treatment or elimination protocol shall be in accordance and coordinated with the Middlesex County Health Department.

Refer to Table 1 - Scheduled Maintenance Schedule.

2.1.3 Annual Basin Maintenance and Inspections

As required by NJDEP, all structural components as described in this Section shall be inspected for cracking, subsidence, spalling, erosion, and deterioration at least annually. In addition to structural inspections, each structure shall be inspected for the accumulation of debris, trash, and sediment. Each catch basin, inlet, outlet, and overflow structure in the collection system shall be cleaned annually by a sewer vacuum truck. The degree of accumulations for each structure shall be documented on the field report, and structures exhibiting faster rates of accumulations shall be scheduled for more frequent cleanings.

Refer to Table 1 - Scheduled Maintenance Schedule.

2.1.4 Basin Unscheduled Maintenance

Additional maintenance measures may be identified and required following scheduled inspection. These unscheduled emergency conditions or as-needed repairs are included as a separate unscheduled maintenance event for the Basin to cover items such as:

- Erosion repairs
- Liner /Filter penetrations
- Check Valve replacements
- Filter material Replacement

2.1.5 Filter Material Replacement Events

The filter drain time evaluation as described in Section 2.1.1 will be used to determine when to schedule the replacement of filter materials within the forebays and surface sand filter. Filter Material replacement is not expected to occur frequently and shall be performed as a last resort after an engineering evaluation is performed by USACE / EPA.

The filter material replacement would consist of mobilizing rubber tired earthwork equipment to the bottom of the Basin to perform the following steps:

- Remove and segregate the 4-inch layer of aggregate for disposal or screening and reuse
- Remove and dispose of the geotextile filter fabric
- Remove and dispose of approximately the top 6-inches of the 24-inch sand layer
- Replace the top of the sand layer with new filter sand, restoring to design elevations
- Replace the geotextile filter fabric
- Replace the 4-inch layer of aggregate

The sideslopes of the basin would require use of specialized equipment such as conveyors, chutes, and/or roll-off boxes to lift and lower materials to and from the bottom of the basin to the surface for subsequent consolidation, staging and disposal. A filter material replacement event report shall be prepared to document the volumes and costs of the materials disposed and replaced.

Refer to Table 2 – Unscheduled Maintenance.

2.2 PAVEMENT MAINTENANCE

The general objectives of the pavement inspections and maintenance for this Site are to maintain the infiltration barrier/protective cap, preserve the capital investments, and provide a safe traveling surface. Maintenance of pavement includes the preservation, restoration, and repair of both surface and underlying layers.

An effective pavement maintenance program specifies the procedures to be followed to assure that proper preventative and remedial pavement maintenance is performed. This pavement maintenance plan is based on guidance documents from the US Department of Transportation and the National Cooperative Highway Research Program (NCHRP). The pavement maintenance program for this Site consists of the following activities as outlined in each of the following sub-sections:

- Annual inspections
- Pavement Condition Index (PCI) Surveys
- Capital Preventative Maintenance (CPM)

2.2.1 Annual Inspections

A drive-by inspection shall occur annually to document changes in the pavement condition. A field report shall be prepared to document the types of distress, their locations, and remedial action proposed or performed (refer to Appendix D for an example pavement drive-by inspection and the blank report template). Various external signs or indicators make the deterioration of a pavement apparent, and often reveal the probable causes of the failure. While different pavement distresses possess their own particular characteristics, the various types of flexible pavement distress generally fall into one of the following broad categories as outlined below for purposes of the drive-by inspections.

- Cracking: Cracks in flexible pavements are caused by deflection of the surface over an unstable foundation, shrinkage of the surface, thermal expansion and contraction of the surface, poorly constructed joints, or reflection cracking. Since cracks allow surface water to enter the subgrade and further destroy the stability of the subgrade, sealing should be accomplished as soon as practical. Efforts should be made to avoid a buildup of crack sealing material.
- Disintegration: Disintegration in a flexible pavement is caused by insufficient compaction of the surface, insufficient asphalt binder in the mix, loss of adhesion between the asphalt coating and aggregate particles, or severe overheating of the mix.
- Distortion: Distortion in HMA pavements is caused by foundation settlement, insufficient compaction of the pavement courses, lack of stability in the bituminous mix, poor bond between the surface and the underlying layer of the pavement structure, and swelling soils or frost action in the subgrade.

2.2.2 Pavement Condition Index Surveys

It is currently envisioned that the asphalt capping material will be subject to very limited vehicular traffic while under EPA control and therefore a Pavement Condition Index (PCI) survey is not expected to be required. However, should the Site usage be increased and found to be subject to more vehicular traffic than expected, a PCI survey shall be required every 3 years, to measure and record the pavement deterioration. The PCI survey shall be in accordance with the applicable provisions of ASTM D 5340 and submitted by a licensed civil engineer experienced in the inspection and maintenance of pavements. The PCI, developed by the United States Army Corps of Engineers, is widely used in transportation engineering and is based on a visual survey of the pavement and a numerical value between 0 and 100 defines the condition with 100 representing an excellent pavement. The process involves the following steps:

- Divide the total pavement section into sample units (each approximately 5,000 square feet).
- Based on the number of sample units in the total section, a certain number of these units are selected to be tested. For example if there are 40 or more sample units, 10% are tested.
- The type, extent and severity of pavement distress in each section are recorded using the ASTM Standard D 5340 method.
- The PCI of each tested sample unit is calculated using the method defined in the standard. In summary this involves calculating the distress quantities and the distress densities for each

tested unit. These values are used to determine a deduct value and this deduct value is subtracted from 100 to give the PCI value.

- The PCI of the total section is then determined based on the sample values.

The PCI provide a good indication of the pavement condition of a network. The licensed civil engineer shall submit with the PCI survey a recommendation and plan for pavement capital preventative maintenance (CPM) treatments and corresponding cost estimates. The typical CPM treatments are as described in the following section.

2.2.3 Critical Preventative Maintenance Pavement Treatments

Techniques used to determine the appropriate time to apply capital preventive maintenance include the following:

- A pavement management system
  - A predetermined treatment schedule or time since a previous maintenance or rehabilitation event
- Maintenance surveys
  - Determining existing distresses to be treated, or anticipated distresses to be prevented or slowed

This maintenance plan combines both approaches by using maintenance (PCI) surveys and scheduled CPM treatments to preserve the life of the pavement cap based on recommendations from the National Cooperative Highway Research Program (NCHRP). Typical bituminous-surfaced pavement capital preventative maintenance (CPM) treatments consist of the following:

- Crack Filling/Crack Sealing
- Fog Seals
- Slurry Seals
- Scrub Seals
- Microsurfacing
- Chip Seals
- Thin Overlay
- Ultrathin Friction Courses

The typical expected life and costs of each CPM treatment are as follows. There is a broad range for some of the treatment lives because the expected life estimates are based on the use of treatment in both a preventative and reactive manner. The costs also cover a wide range of applications and regional variations. Since the treatments also depend on the distresses, the schedule and budget in this O&M Plan assume an average of 3 years between CPM treatments.

- Crack Filling/Crack Sealing
  - Expected Life: 2 to 6 years
  - Typical Costs: $0.30 to $1.50/linear foot
- Fog Seals
  - Expected Life: 1 to 2 years
  - Typical Costs: $0.30 to $0.45/square yard
- Slurry Seals
  - Expected Life: 3 to 5 years
  - Typical Costs: $0.30 to $0.45/square yard
- Scrub Seals
  - Expected Life: 1 to 3 years
  - Typical Costs: $0.75 to $1.25/square yard
- Microsurfacing
  - Expected Life: 4 to 7 years
  - Typical Costs: $0.90 to $1.70/square yard
- Chip Seals
  - Expected Life: 4 to 7 years
  - Typical Costs: $0.75 to $0.90/square yard for single application
  - Typical Costs: $1.10 to $1.25/square yard for double application
- Thin Overlay
  - Expected Life: 7 to 10 years
  - Typical Costs: $1.75 to $2.00/square yard for dense graded mixes
- Ultrathin Friction Courses
  - Expected Life: 7 to 10 years
  - Typical Costs: $2.50 to $3.00/square yard

Emergency repairs may be necessary because of the time of the year and season (i.e., winter) may delay implementation of the CPM treatments. Emergency repairs may include the following and shall be included in the annual unscheduled maintenance budget:

- Cold patching of pot holes and/or large cracks

- Hot patching of pot holes and/or large cracks

2.3 MISCELLANEOUS SITE MAINTENANCE

The general objectives of maintenance for the miscellaneous site features are to perform seasonal cleanup, maintenance, and repairs to preserve the capital investments and to provide emergency / unscheduled maintenance if needed.

The maintenance program, at a minimum shall consist of the following activities as outlined in each of the following sub-sections:

- Quarterly inspections.
- Seasonal maintenance.
- Unscheduled maintenance / repairs.

2.3.1 Quarterly Inspections

An inspection shall occur quarterly and a field report shall be prepared and submitted to identify and document any of the following common problems:

- Infrastructure Damage.
- Accumulation of trash and debris.
- Vegetation and weed growth.

2.3.2 Quarterly Maintenance

Maintenance shall be performed quarterly at a minimum. All disposal activities shall be in accordance with the approved waste disposal policies. Trees, shrubs, and underbrush shall be pruned, trimmed, or removed and weeds shall be controlled as necessary during the growing season. The quarterly seasonal maintenance events shall include the following activities:

- Site Maintenance
  - Removal of trash and debris and dead and downed vegetative debris
  - Perimeter fencing repairs, gate locks, monitoring well locks, signage.
  - Vegetation and weed control, mowing, trimming, pruning or removal.
- Winter Maintenance
  - Removal of snow from Hamilton Blvd pedestrian sidewalk and entrance gate areas.

2.3.3 Unscheduled Site Maintenance

Unscheduled site maintenance includes provisions for emergencies such as storm or vandalism damage and debris removal, perimeter fence repairs for site security.

2.4 SCHEDULED MAINTENANCE

As described in this O&M Plan, there are multiple "scheduled" maintenance events on quarterly and yearly cycles for each major component of the Site. Refer to Table 1 for the scheduled maintenance events and their corresponding time cycles. These scheduled maintenance events shall occur based on the scope of work as defined in this O&M Plan a field report shall be prepared and submitted to document the completion of each scheduled event. Completed field reports from scheduled maintenance events shall be retained in accordance with Section 3.0 of this O&M Plan.

2.5 UNSCHEDULED MAINTENANCE

As described in this O&M Plan, there are multiple "unscheduled" maintenance activities that are expected to occur on an as-needed or emergency basis. Potential unscheduled maintenance activities are outlined on Table 2. Upon identification of the unscheduled maintenance, a Field Change Request shall be submitted to the contracting officer. Following completion of the unscheduled maintenance a field report shall be prepared to document the corrective actions implemented and shall be retained in accordance with Section 3.0 of this O&M Plan.

3.0 Maintenance Plan Procedures

The NJDEP Stormwater Management Rules require that the following procedures be followed:

- This O&M plan shall be maintained by EPA has owner / operator and Point-of-Contact of the stormwater management measure.
  - Copies shall also be submitted to the NJDEP upon request.
  - Copies shall be provided to the local mosquito control (Middlesex County Health Department) upon request.
- The title and date of the maintenance plan and the name, address, and telephone number of the person with stormwater management measure maintenance responsibility as specified in the plan shall be recorded on the deed of the property on which the measure is located. Any change in this information due, for example to a change in property ownership, shall also be recorded on the deed.

  (Note: EPA is currently the POC for the Site, as the lead agency conducting the remedial activities. EPA does not and will not hold title to the property. EPA will advise NJDEP when and if another party assumes responsibility for O&M at the Site. Further, EPA anticipates that upon completion of Superfund remedial activities, EPA and NJDEP will work cooperatively, as lead agency and support agency, to ensure that appropriate information is recorded on the deed.)

- The person with maintenance responsibility as designated in this plan (EPA) shall evaluate the maintenance plan for effectiveness and at least annually and revise as necessary.
- Field Report Forms (Appendix D) and any additional information documenting preventative and corrective maintenance performed at the Site shall be kept as part of the Maintenance History (Appendix G). The person with maintenance responsibility as designated in this plans shall retain and, upon request, make available the maintenance plan and associated logs and other records for review by a public entity with administrative, health, environmental, or safety authority over the site.

3.1.1 Site Access

All stormwater management measures' components, pavement, and site features, shall be readily accessible for inspection and maintenance. Therefore, trees, shrubs, and underbrush shall be pruned, trimmed, or removed as necessary to maintain access to the stormwater management measure.

3.1.2 Training of Maintenance Personnel

Maintenance personnel shall be trained as appropriate in specialized inspection and maintenance tasks and/or the operation and care of specialized maintenance equipment. Refresher training of maintenance personnel shall occur as needed, preferably just prior to annual inspection milestones, to cover lessons learned during the previous preventive and corrective actions, and to review any new maintenance provisions and/or requirements.

4.0 REFERENCES

New Jersey Stormwater BMP Manual, New Jersey Department of Environmental Protection, February 2004.

Guidelines and Procedures for Maintenance of Airport Pavements, Advisory Circular No. 150/5380-6B, US Department of Transportation, Federal Aviation Administration, 2007.

Optimal Timing of Pavement Preventative Maintenance Treatment Applications, NCHRP Report 523, National Cooperative Highway Research Program, Transportation Research Board, 2004.

ASTM D5340-10: Standard Test Method for Airport Pavement Condition Index Surveys.

United States Environmental Protection Agency, Region II, September 2004. "Record of Decision for Operable Unit 2" Cornell-Dubilier Electronics Superfund Site, South Plainfield, New Jersey.

Cornell-Dubilier Electronics Superfund Site
Operable Unit 2
February 2014

Table 1 - Routine Scheduled Maintenance

Maintenance Category	Event	Frequency
Stormwater Basin and Collection System	Drain Time Inspections	Twice a Year
	Debris, Trash, Vegetation and Sediment Removal and Inspections	Quarterly
	Annual System Structural Maintenance and Inspections	Annually
	Unscheduled Inspections After 1-inch Storm Events	As needed
Pavement	Annual Inspections	Twice a Year
	Pavement Condition Index Surveys	2-Year Cycle
	Pavement Maintenance and Repairs	As needed
General Housekeeping	Monthly Inspections	Monthly
	Debris, Trash, and Vegetation Cleanup	As Needed
	Snow Removal	Per Event > 2"

Table 2 - Unscheduled Maintenance

Maintenance Category	Event	Frequency
Stormwater Basin and Collection System	Unscheduled Filter Material Replacement Events (Assumes 24,000 sq feet)	As needed - Dependent on Drain Time Inspections
Pavement	Critical Preventative Maintenance Treatments (Assumes 106,000 sq yds)	3-Year Cycle
General House Keeping	NA	

APPENDIX A

APPENDIX B

APPENDIX C

APPENDIX D

APPENDIX E

APPENDIX F

APPENDIX G

APPENDIX H

APPENDIX I

APPENDIX A

Appendix A
Normal Drain (Drawdown) Time Calculation
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

From the New Jersey Stormwater Best Management Practices Manual, Equation 9.9-1:

$$A_S = \frac{(V_{QS})(TH_S)}{[(k)(\frac{D_{ST}}{2} + TH_S)(T_D)]}$$

Equation 9.9-1

Where:
A_S = Minimum Sand Bed Surface Area (in square feet)
V_{QS} = Runoff Volume from the Stormwater Quality Design Storm (in cubic feet)
TH_S = Thickness of Sand in Sand Bed (in feet)
k = Sand Bed Design Permeability (in feet per day)
D_{ST} = Maximum Temporary Sand Bed Depth (in feet)
T_D = Sand Bed Drain Time (in days)

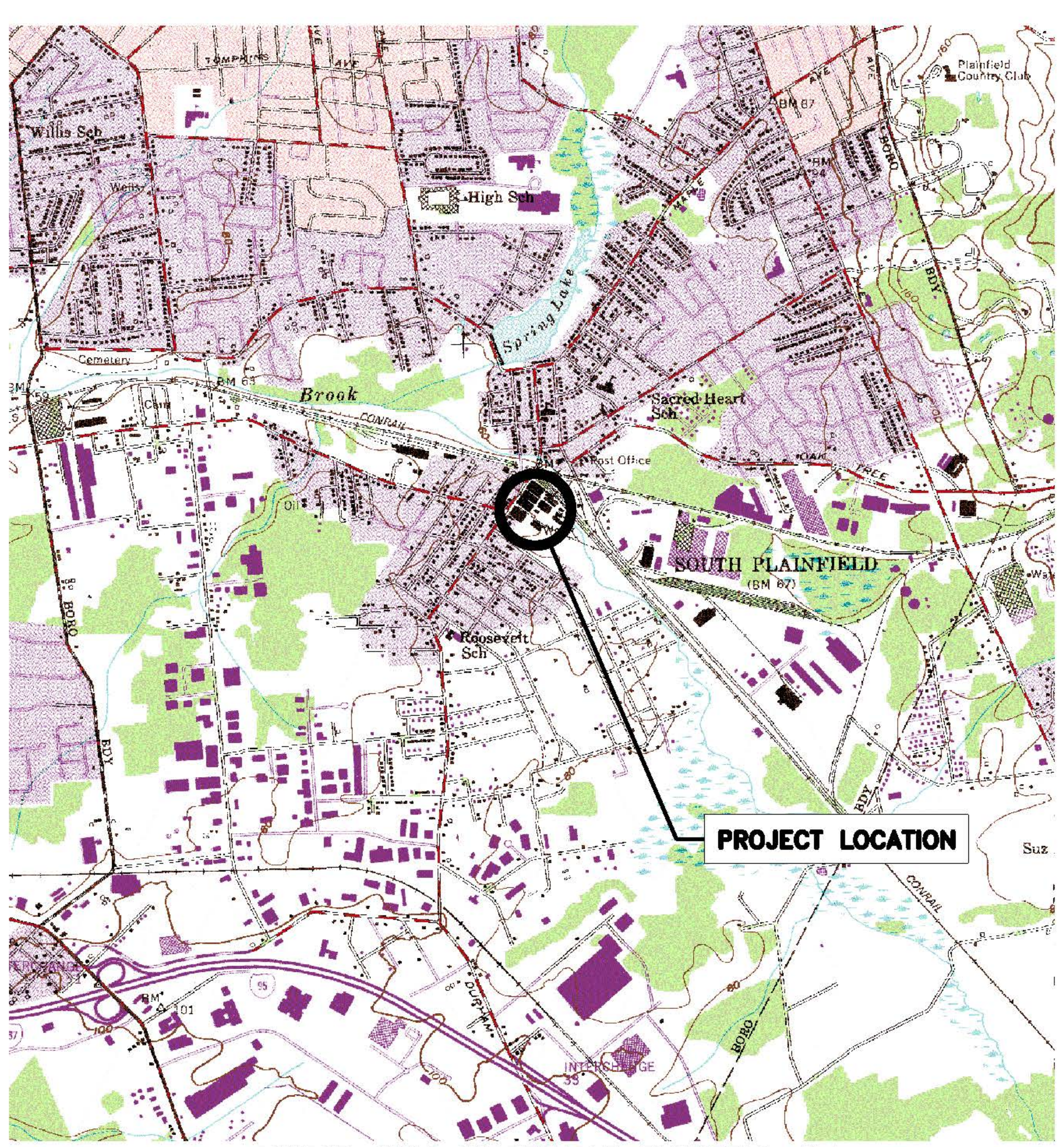
Solving for the Sand Bed Drain Time (T_D) and using the values and/or actual measurements below,
A_S = Minimum Sand Bed Surface Area = 9,660 ft^2
V_{QS} = Runoff Volume from the Stormwater Quality Design Storm = 82,621 ft^3
TH_S = Thickness of Sand in Sand Bed = 2 ft
k = Sand Bed Design Permeability = 4 ft/day
D_{ST} = Maximum Temporary Sand Bed Depth = 3.5 ft

T_D = .88 days or 21.1 hours

APPENDIX B

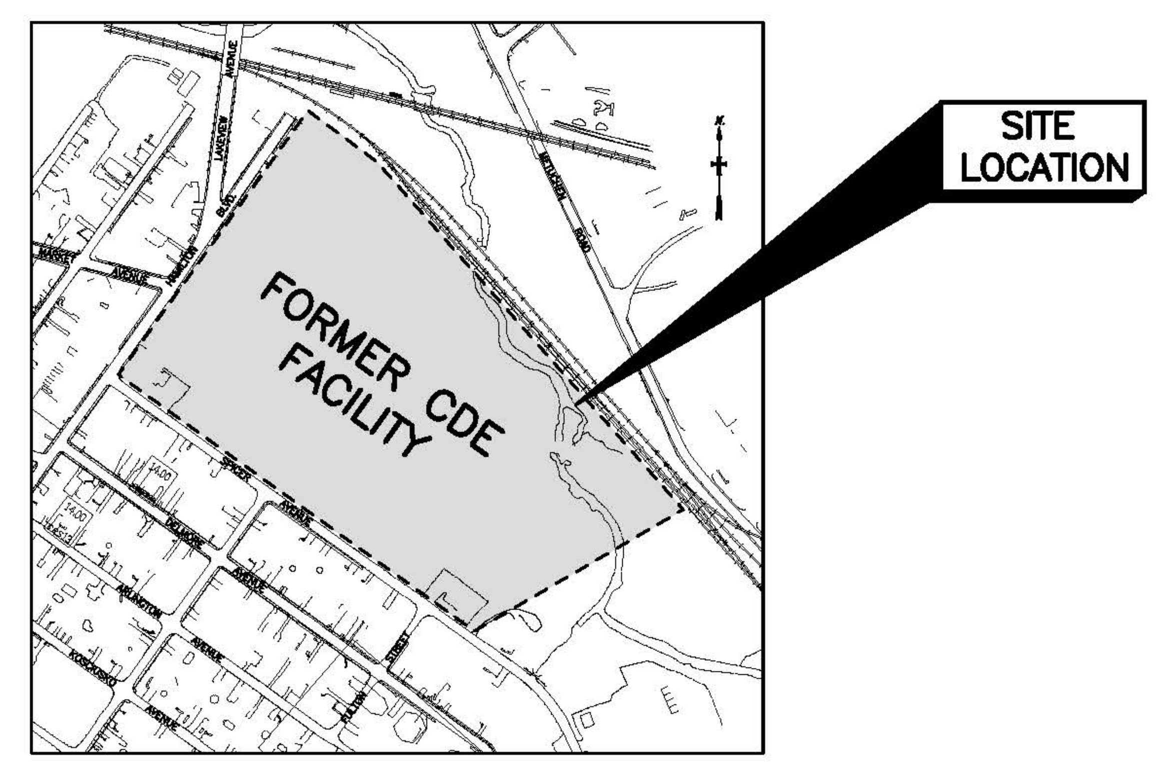
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE OU2 SOILS REMEDIATION SOUTH PLAINFIELD, NEW JERSEY

BOROUGH OF SOUTH PLAINFIELD
MIDDLESEX COUNTY, NEW JERSEY

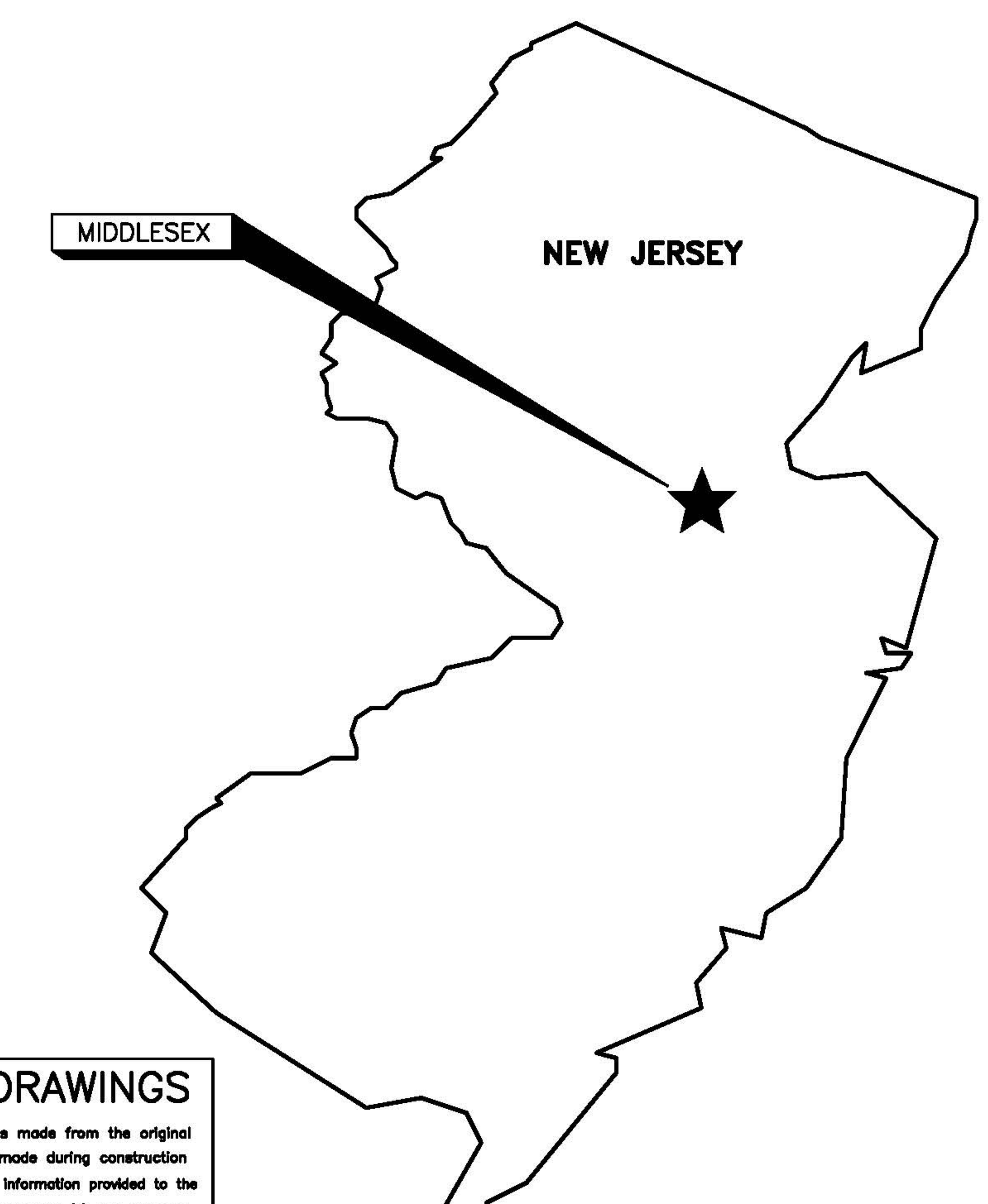


SOURCE: USGS QUADRANGLE, PLAINFIELD, N.J.

12,000 0 24,000
SCALE: 1" = 24,000'



600 0 1200
SCALE: 1" = 1200'



NOT TO SCALE

US Army Corps of Engineers

Sevenson Environmental Services, Inc.

ARCADIS

SEPTEMBER 2013

RECORD DRAWINGS

This drawing reflects changes made from the original contract drawing that were made during construction and has been prepared from information provided to the Engineer by the construction contractor (s). The Engineer does not warrant this drawing to be complete and accurate in all respects.

Date 9/13 By LB / ARCADIS

Symbol	Description	Date	Approved
1	RECORD DRAWINGS	9/13	CTD

Revisions

U.S. Army Corps of Engineers
KANSAS CITY DISTRICT

U.S. ARMY ENGINEER DIVISION
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KANSAS CITY DISTRICT
KANSAS CITY, MISSOURI

ARCADIS
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44 SOUTH BROADWAY, 15th FLOOR
WHITE PLAINS, NEW YORK 10601

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Drawn by: CD	Date:	File Name: G01-4553COV.DWG	
Reviewed by: BG	Date:		

CORNELL-DUBILIER ELECTRONICS
SUPERFUND SITE OU2 SOILS REMEDIATION
SOUTH PLAINFIELD, NEW JERSEY

COVER SHEET

G-01

Sheet 1 of 9

User:WELSHANS Spec:PIRNIE STANDARD File:G:\Projects\4553033\CADD\SOILS REMEDIATION\FINAL LAND USE\RECORD DRAWINGS\GEN\G01-4553COV.DWG Scale:1:1 Date:09/24/2013 Time:13:15 Layout:Layout1

INDEX OF DRAWINGS

DRAWING NO.	TITLE	NOTES
G-01	COVER SHEET	
G-02	INDEX OF DRAWINGS, LEGEND, ABBREVIATIONS & GENERAL NOTES	
G-03	EXCAVATION PLAN	
G-04	BOTTOM OF EXCAVATION ELEVATIONS	
G-05	PAVING AND DRAINAGE PLAN	
G-06	MISCELLANEOUS DETAILS – 1	
G-07	MISCELLANEOUS DETAILS – 2	
G-08	MISCELLANEOUS DETAILS – 3	
G-09	MISCELLANEOUS DETAILS – 4	

LEGEND

- FENCE LINE
- ROW/PROPERTY LINE
- OU2 BOUNDARY
- 72 CONTOUR
- TREE/BRUSH
- WETLANDS
- INLET
- HYDRANT
- CATCH BASIN
- WATER VALVE
- WATER MARKER
- POWER POLE
- MANHOLE
- CLEANOUT
- W WATER LINE
- G GAS LINE
- OH OVERHEAD ELECTRIC
- D STORM

ABBREVIATIONS

ELEC	ELECTRIC
WV	WATERVALVE
F.F.	FINISHED FLOOR
CONC.	CONCRETE
FH	FIRE HYDRANT
P/P	POWER POLE
ELEV.	ELEVATION
WM	WATER MARKER
RCP	REINFORCED CONCRETE PIPE
INV.	INVERT
GR	GRADE
GUY	GUY WIRE
CDA	CAPACITOR DISPOSAL AREA

RECORD DRAWINGS

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Date 9/13 By LB / ARCADIS

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Revisions: 1 | RECORD DRAWINGS | 9/13 | CTD

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Approved by: Date:
File Name: G02-4553G002.DWG

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SOUTH PLAINFIELD, NEW JERSEY

INDEX OF DRAWINGS, LEGEND, ABBREVIATIONS & GENERAL NOTES

G-02

Sheet 2 of 9

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LEGEND

OU2 BOUNDARY

SHADING REPRESENTS REMEDIAL EXCAVATION AREAS

SHADING REPRESENTS LOCATION OF PREVIOUSLY EXCAVATED CDA

NOTE:

1. 30'x30' GRIDS USED TO REPRESENT EXCAVATED AREAS; BUT ACTUAL HORIZONTAL EXCAVATION LIMITS VARIED ALONG PERIMETER.

RECORD DRAWINGS

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Date 9/13 By LB / ARCADIS

0 40 80 160

SCALE: 1" = 80'

Verify Scale

bar is one inch on original drawing.

0 1"

U.S. Army Corps of Engineers KANSAS CITY DISTRICT

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1	RECORD DRAWINGS	9/13	CTD

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Reviewed by: BG Date:

Approved by: Date:

File Name: G04-4553G004.DWG

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CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE OU2 SOILS REMEDIATION SOUTH PLAINFIELD, NEW JERSEY

EXCAVATION LIMITS

G-03

Sheet 3 of 9

User: WELSHANS Spec: PIRNIE STANDARD File: G:\Projects\4553033\CADD\SOILS REMEDIATION\FINAL LAND USE\RECORD DRAWINGS\GEN\G04-4553G004.DWG Scale: 1:1 Date: 09/24/2013 Time: 13:14 Layout: Layout1

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BB	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR	RR																																
BA	RR	RR	RR	RR	RR	62.9	62.8	64	63	63*	63*	63*																																
A				GR*	GR	GR	63.4	GR	GR*				RR	RR*	RR	RR	RR	RR																										
B				67*	67	67	67.3	68	67		TP			67*	67	68	69*		RR	RR	RR																							
C			67*	68*	67	67	67.2	67*							69	65* BR		65				RR	RR																					
D					67*	67*									68*	68*																												
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J					70	71						MT	MT	MT			MT			MT					TP	TP	66*	66	63*															
K			70*	70*	70	70*						MT	MT	MT													67*	67	59	59*	64*													
L			71*	71	72	72										68*	68*	67*	67*	67	64*						67	67	66	66	66	64*	64*	66*	TP									
M					73	73*										68	68	68	68	67	68	67	67	70	69	69 BR	69 BR	65	64	64	66	66 BR	66 BR	63 BR				58						
N																67	69	68	68	68	67	67	70	69 BR	68	66	66	67	65	65	65	66 BR	66 BR	63	62	60	62* BR	58 BR	60	61*				
O		73*	75	75*				TP								67	65	65	68	68	68	68	68	69	69	66 BR	67 BR	66	66	66	66	64	64	63	63 BR	62 BR	62 BR	61 BR	62	62*				
P		75	75	75	75	75*	75.3*							69	69	69	69	63	65	63	63	68	68	63	68	61 BR	67	66	64	65	68 BR	64	65	64	64	63 BR	58	59 BR	60	60	61*			
Q		76	76	76	76*	76*	76*								69	69	69	69	69	69	68	68	61 BR	68	61 BR	68 BR	67	64	67	66	66 BR	66 BR	67	66	66	65	65	64	61	60	70			
R		76*	77	77									75*	71*	71	70	70	69	69	69	69	69	61 BR	61 BR	61	61 BR	61 BR	61 BR	61 BR	66	66	67	CDA	CDA	CDA	CDA	CDA	CDA	64	63	66			
S				78								76*	74	71	71	70	70	70	70	69	69	62	61	61 BR	61 BR	61 BR	61 BR	61 BR	CDA	CDA	CDA	CDA	CDA	CDA	CDA	CDA	CDA	CDA	65	64	63			
T											76*	75	75	75	70	71	70	69	68	69	62	62 BR	62 BR	61 BR	61 BR	61 BR	62 BR	61 BR	CDA	CDA	CDA	CDA	CDA	CDA	CDA	CDA	CDA	66 BR	66	64	63	63*		
U											76*	73	71	68	70	72	70	70	70	71	62 BR	62 BR	62 BR	61 BR	61 BR	61 BR	62 BR	62 BR	CDA	CDA	CDA	CDA	CDA	CDA	CDA	CDA	CDA	67	66	64	64	63*		
V										78*	76	76	74	69	70	70	70	70	69	72	61 BR	62 BR	62 BR	62	65	68	68 BR	68 BR	CDA	CDA	CDA	CDA	CDA	CDA	CDA	CDA	CDA	67	66	65	64	62*		
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Y											77*	76	75	75	74	75	73	73	71	62	62	62	61	61	62	67	67	67	71	72	72	70 BR	69	68	68	69	70	70	69	66	66	65	64*	
Z												76*	75	75	74	74	73	73	72	72		62* BR	61*	61	62	69	64	69	71	68	68	72 BR	69	68	71	70	70	70	69	66	66	66	66	
AA									78*	78	77*	76	76	75	74	73	73	73	73	73				60	69*	69*	68*	68	67	65	72	72	69	69	68	71	71	70	69	70	69	68	68	65*
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AD																						TP			TP			TP			TP			TP			TP		70*	69*	68*	67*	66*	
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AF																						75*	74*	74*	74*	74*	74*	74*	74*	74*	73*	73*	73*	72*	71*	71*	71*	70*						
AG																					75*	75*	74*	74*	74*	74*	74*	74*	74*	75*	73*	73*	73*	72*	72*	72*	72*	71*						

LEGEND

74	–	ELEVATION OF BOTTOM OF EXCAVATION
74	–	CLEAN FILL FROM CDA EXCAVATION ENCOUNTERED, NO SIDEWALL SAMPLES COLLECTED
GR	–	SAMPLES OBTAINED CLOSE TO GRADE
RR	–	SAMPLES ON CONRAIL PROPERTY – NO ELEVATIONS MAXIMUM 4 FOOT EXCAVATION
TP	–	TEST PIT SAMPLES
MT	–	LTTD TREATMENT PAD AREA – POST REMOVAL SAMPLES
BR	–	BEDROCK, NO FLOOR SAMPLES OBTAINED
CDA	–	EXCAVATED UNDER SEPARATE CONTRACT. ELEVATIONS ARE LOCATED IN THE OU2 CDA RA REPORT (2009)

NOTE:

1. REMEDIAL EXCAVATION BOTTOM AND PERIMETER SIDEWALL CONFIRMATORY SAMPLE RESULTS ARE LOCATED IN AN APPENDIX OF THE OU2 SOILS RA REPORT.

* CONFIRMATORY SAMPLES ASSOCIATED WITH THESE GRIDS ARE IDENTIFIED IN THE BACKFILL/CROSS SECTION DOCUMENTS INCLUDED IN AN APPENDIX OF THE OU2 SOILS RA REPORT.

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Date 9/13 By LB / ARCADIS

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Revisions

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File Name: G05-4553G005.DWG

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WHITE PLAINS, NEW YORK 10601

CORNELL–DUBILIER ELECTRONICS
SUPERFUND SITE OU2 SOILS REMEDIATION
SOUTH PLAINFIELD, NEW JERSEY

SUPPLEMENTAL REMEDIAL INFORMATION:
SAMPLE LOCATIONS AND EXCAVATION BOTTOM ELEVATIONS

G–04

Sheet 4 of 9

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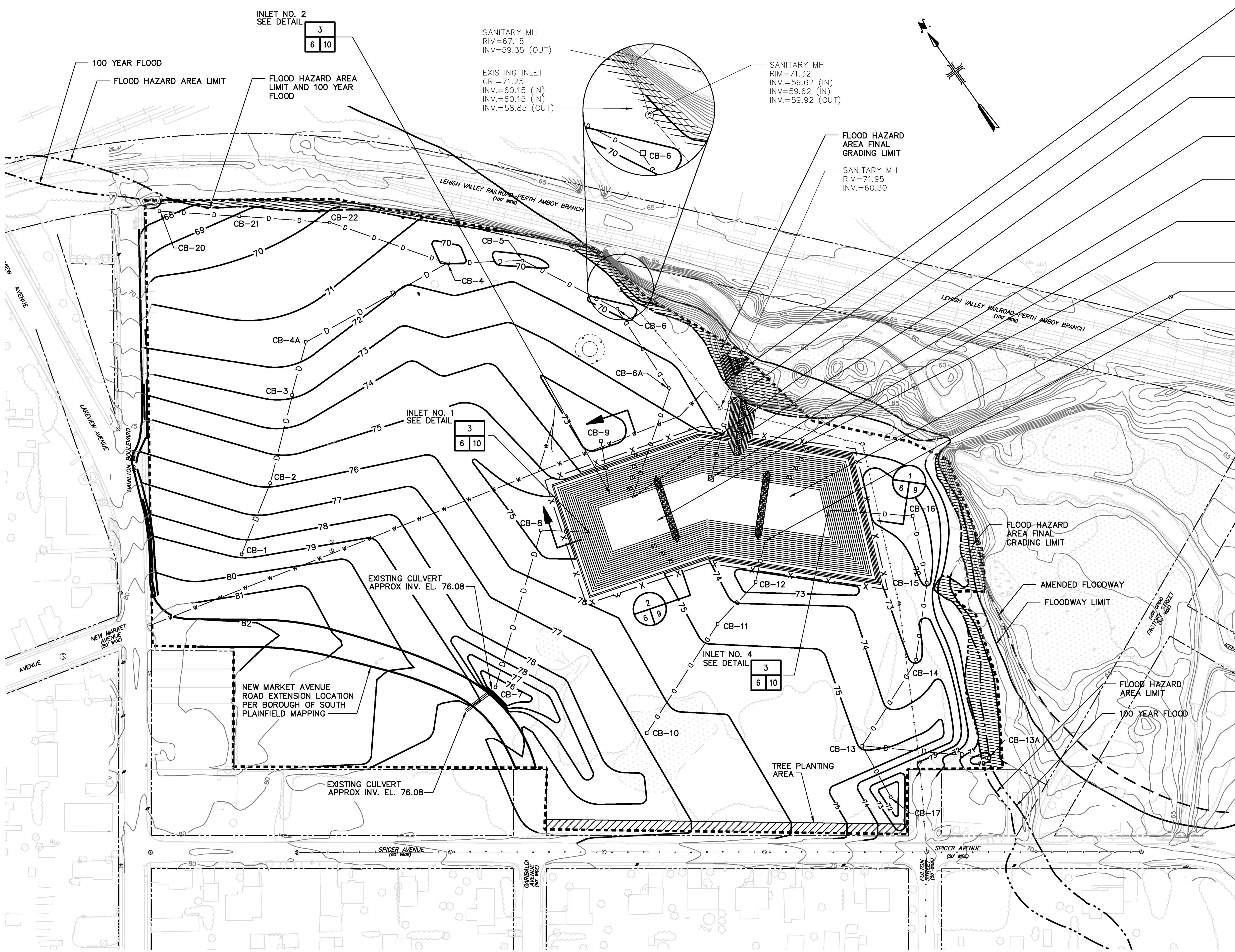

CATCH BASIN SCHEDULE				
BASIN NO.	TYPE	RIM EL.	INV. EL. (IN)	INV. EL. (OUT)
CB–1	1	78.80	–	70.33
CB–2	1	75.80	68.83	68.83
CB–3	1	72.80	67.78	67.78
CB–4	1	70.50	66.00	62.40
CB–4A	1	71.50	67.30	67.30
CB–5	1	70.50	62.40	62.40
CB–6	1	70.50	62.00	62.00
CB–6A	1		61.50	62.50
CB–7	2	75.50	–	69.50
CB–8	2	74.50	68.68	68.68
CB–9	1	72.50	–	68.00
CB–10	1	76.80	–	72.00
CB–11	1	74.50	68.00	68.00
CB–12	1	72.50	67.60	67.60
CB–13	1	75.00	65.53	65.53
CB–13A	2	69.50	–	66.00
CB–14	1	73.00	65.03	65.03
CB–15	1	71.80	64.63	64.63
CB–16	1	71.20	64.28	64.28
CB–17	2	71.50	–	67.33
CB–20	3	67.80	63.79	63.79
CB–21	3	68.80	63.55	63.55
CB–22	3	70.00	63.20	63.20

PIPE SCHEDULE	
PIPE RUN	DIA. (FT)
CB–1 TO CB–2	1.0
CB–2 TO CB–3	1.0
CB–3 TO CB–4A	1.5
CB–4A TO CB–4	1.5
CB–4 TO CB–5	2.5
CB–5 TO CB–6	2.5
CB–6 TO 6A	2.5
CB–6A TO POND	2.5
CB–7 TO CB–8	2.0
CB–8 TO POND	3.0
CB–9 TO POND	1.5
CB–10 TO CB–11	1.0
CB–11 TO CB–12	1.5
CB–12 TO POND	2.0
CB–13A TO CB–13	1.0
CB–13 TO CB–14	1.5
CB–14 TO CB –15	2.0
CB–15 TO CB–16	2.0
CB–16 TO POND	2.5
CB–17 TO CB–13	1.0
CB–20 TO CB–21	1.5
CB–21 TO CB–22	2.5
CB–22 TO CB–4	2.5
POND OUTLET	1.5

DRAWING FOR DETAIL REFERENCES AND INFORMATIONAL PURPOSES ONLY (SEE NOTE 1)

NOTE:

1. REFER TO MOUNTAIN VIEW LAYOUT RECORD SURVEY (JULY 2012) LOCATED IN APPENDIX XX OF THE OU-2 SOILS RA REPORT FOR FINAL SITE TOPOGRAPHY AND SITE FEATURES.

LEGEND

- OU2 BOUNDARY
- 76 PROPOSED CONTOURS
- FLOOD HAZARD AREA WITHIN OU2 BOUNDARY

RECORD DRAWINGS

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Date 9/13 By LB / ARCADIS

0 40 80 160

SCALE: 1" = 80'

Verify Scale

bar is one inch on original drawing.

0 1"

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KANSAS CITY DISTRICT

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1	REVISED ENTIRE SHEET	11/12/10	JTS
2	RECORD DRAWINGS	9/13	CD

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File Name: G06-4553G006.DWG

CORNELL-DUBILIER ELECTRONICS
SUPERFUND SITE OU-2 SOILS REMEDIATION
SOUTH PLAINFIELD, NEW JERSEY

PAVING AND DRAINAGE PLAN

G- 05

Sheet 5 of 9

XREFS: ..\XREF\IP-LOC.dwg ..\XREF\FINAL CONTOURS.dwg ..\XREF\FLOOD LINES.dwg ..\XREF\WATER-TOWER.dwg ..\XREF\TITLEBLOCK-SOIL.dwg ..\XREF\4553GSP.dwg IMAGES:None
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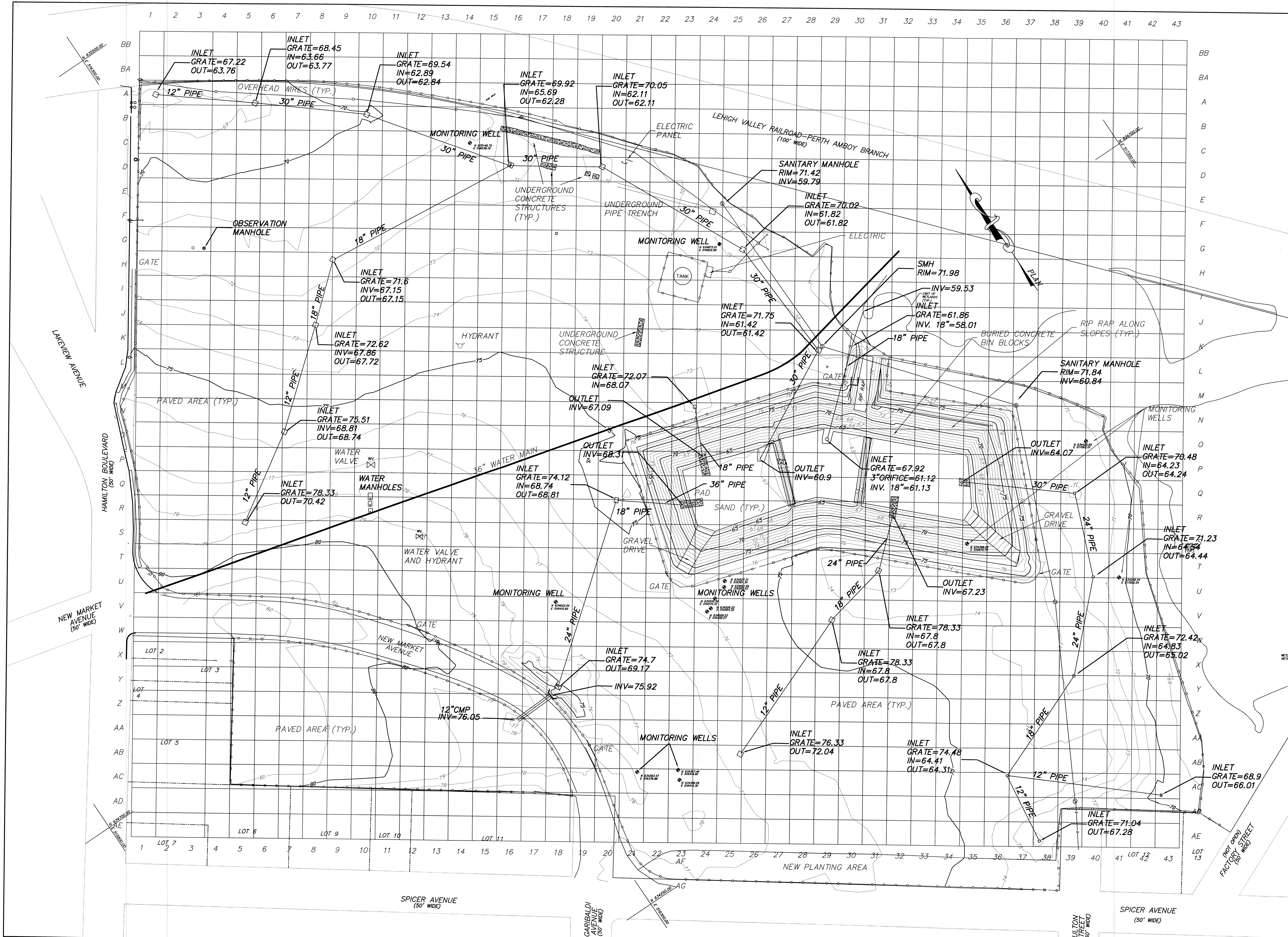

DCA	8/28/2013	CHANGE DRAWING TITLE

GRAPHIC SCALE

1 inch = 50 ft.

MARC J. CIFONE
PROFESSIONAL LAND SURVEYOR
N.J.P.L.S LIC. No. GS 41329

Field	Drawn	Checked	Approved	Date
BEN	BEN	DCA	MJC	07/25/2012

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Land Surveying & Construction Layout
Certificate of Authorization #24GA27978900
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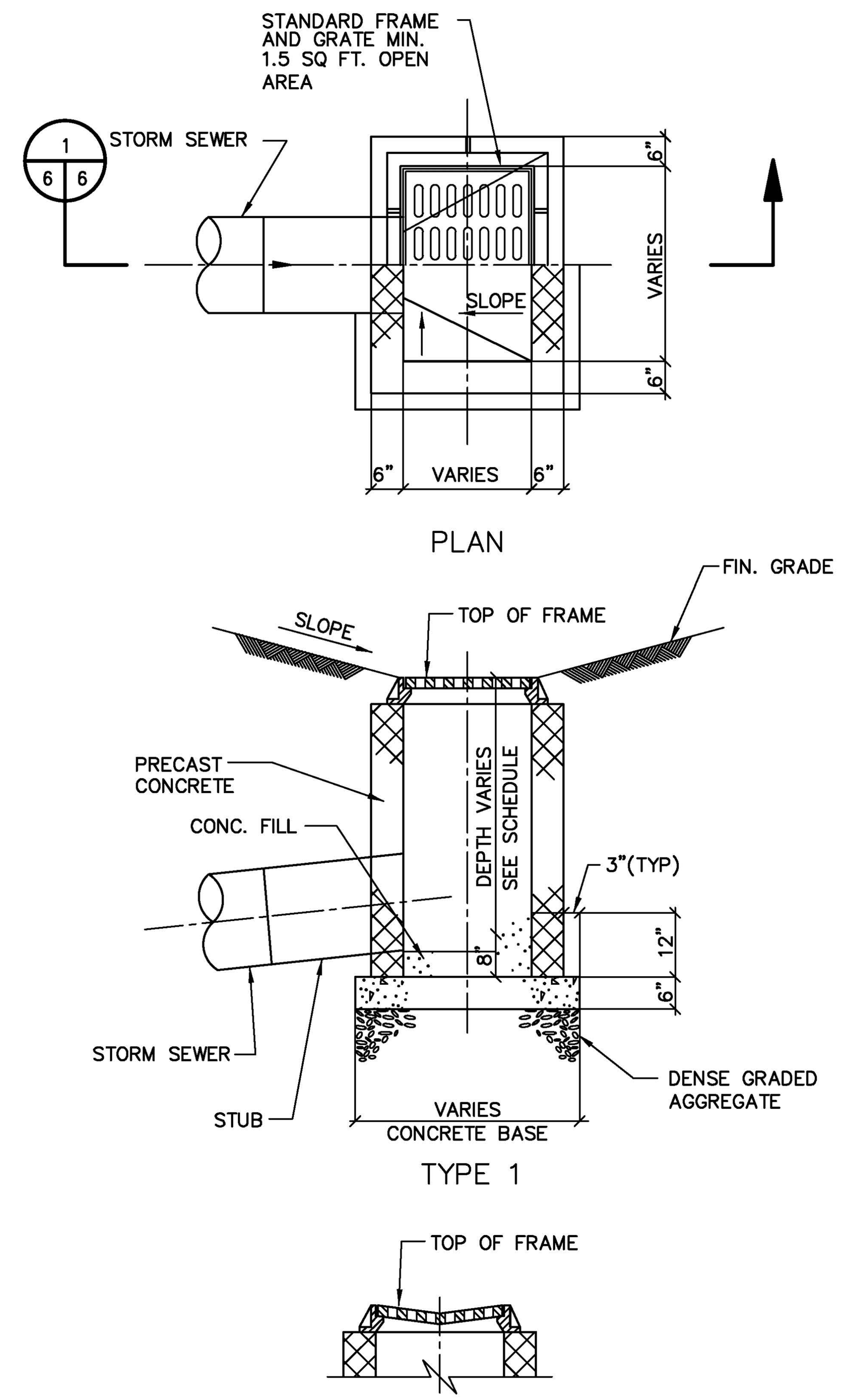
126 Shaub Road – Clarksboro, NJ (856) 415-1133

RECORD DRAWING AS-BUILT
CORNELL SUPERFUND SITE
SOUTH PLAINFIELD, NJ

Project Number	SHEET
MVL0744	1 OF 1



SECTION 1/6 6

CATCH BASIN DETAIL
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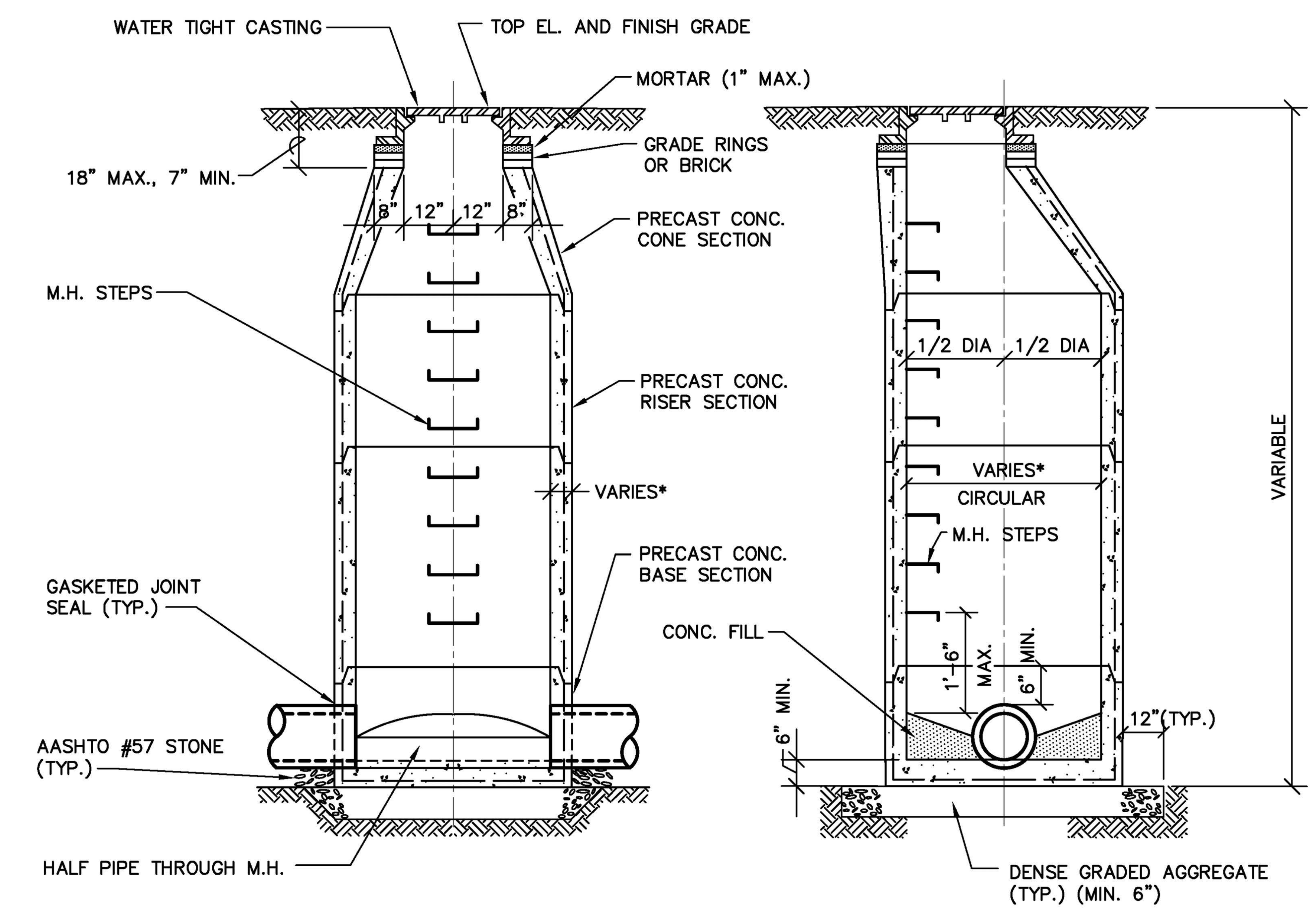
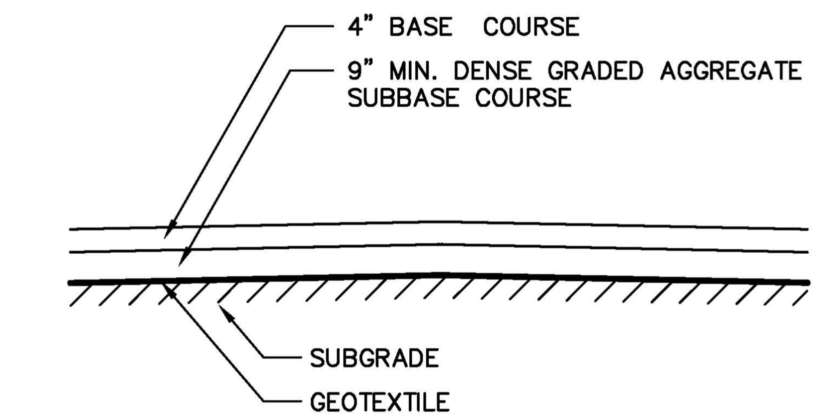


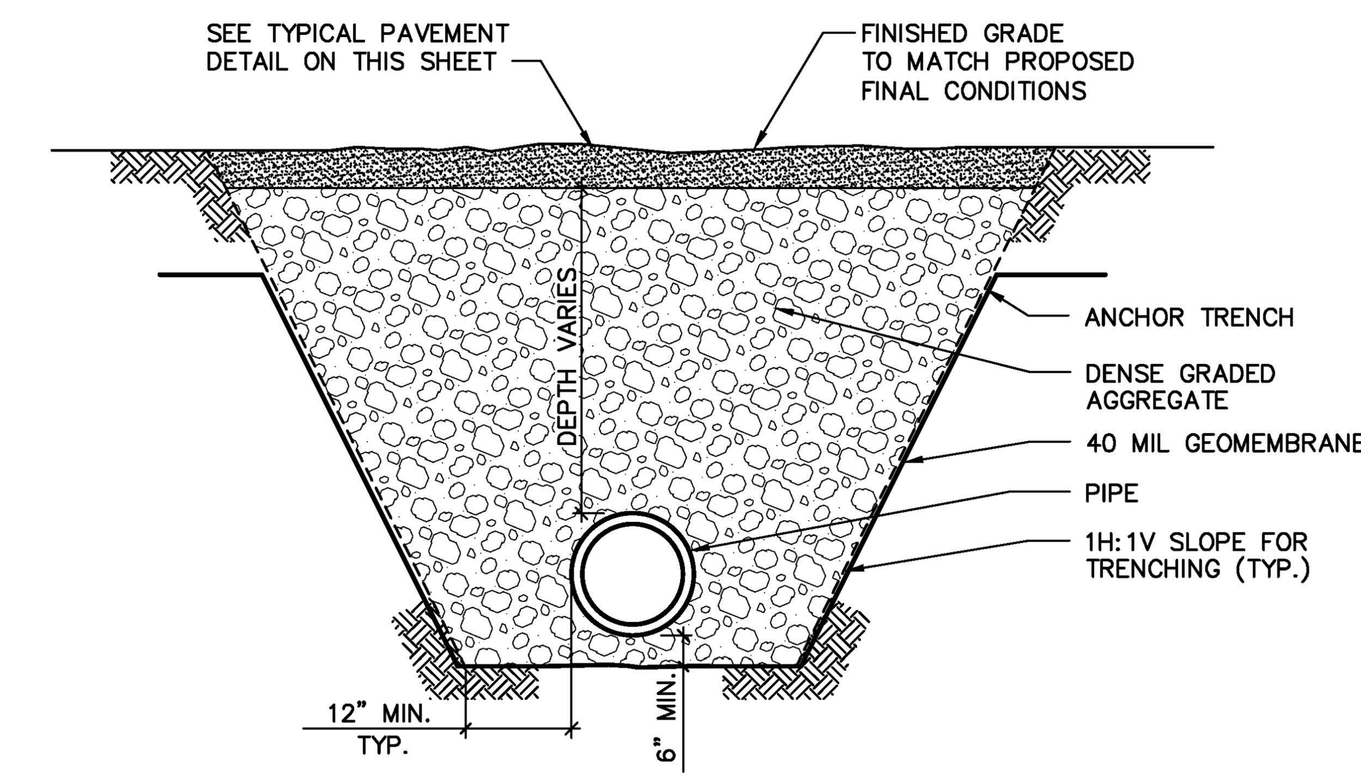
STORM WATER MANHOLE DETAIL
NOT TO SCALE



TYPICAL PAVEMENT DETAIL
NOT TO SCALE

NOTE:

1. ALL PAVEMENT MATERIAL AND INSTALLATION WAS BE IN ACCORDANCE WITH NJDOT.
2. PAVEMENT SLOPE VARIED, SEE NOTE 1 ON SHEET G-03.



"CLEAN" UTILITY TRENCH DETAIL
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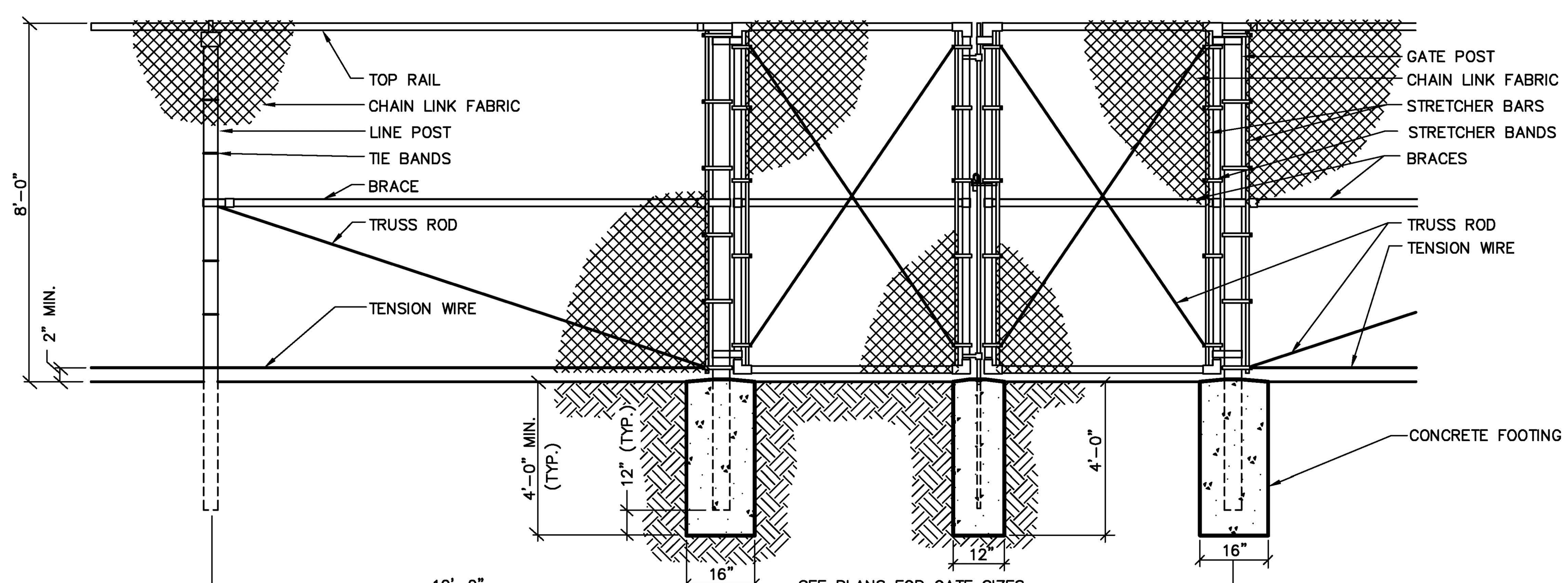

DOUBLE GATE DETAIL
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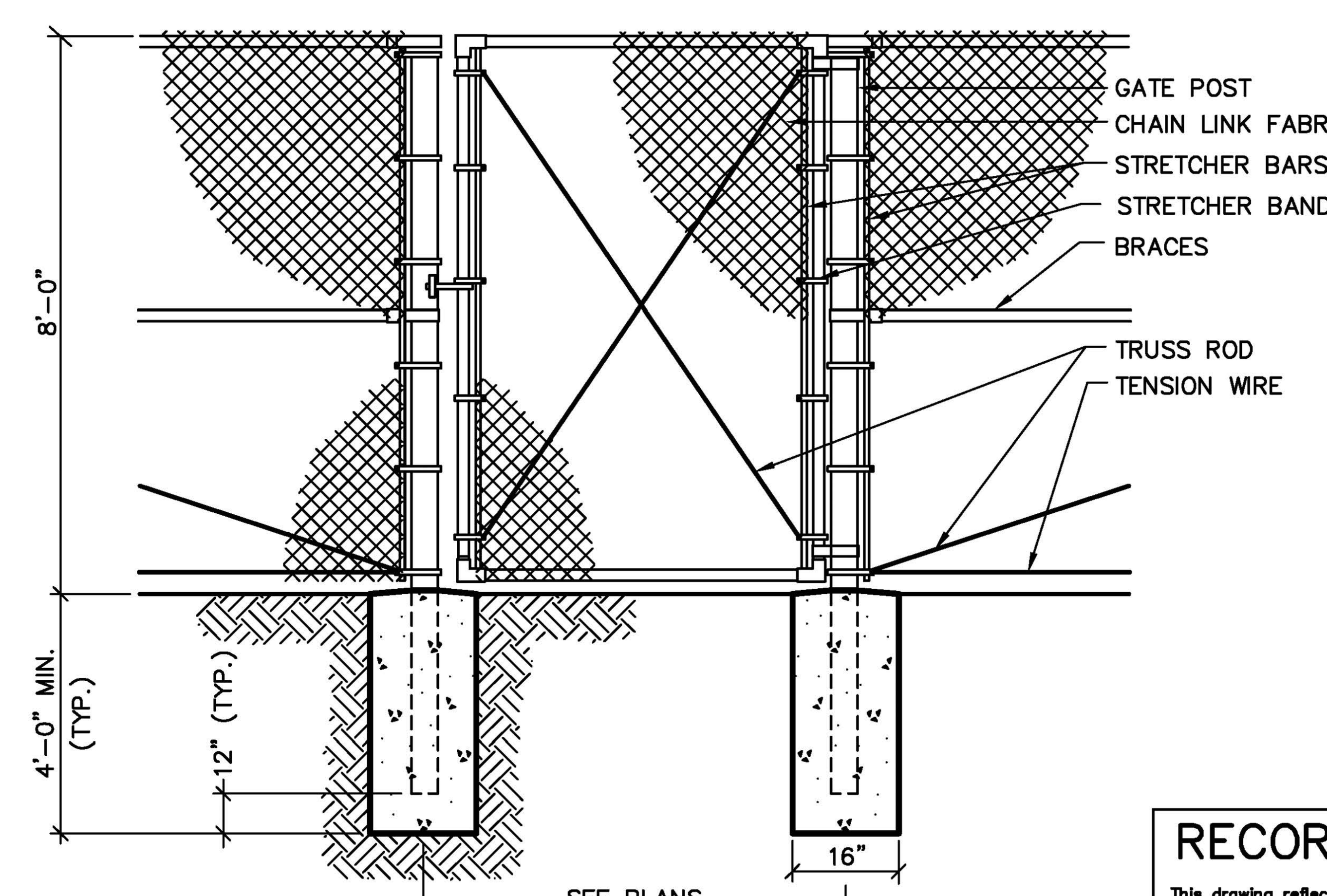

SINGLE GATE DETAIL
NOT TO SCALE

RECORD DRAWINGS

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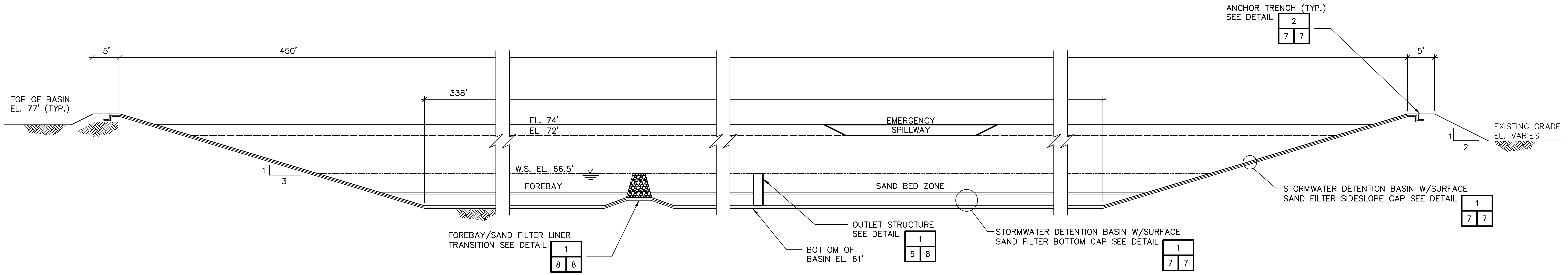
SUPERFUND SITE OU2 SOILS REMEDIATION
SOUTH PLAINFIELD, NEW JERSEY

MISCELLANEOUS DETAILS - 1

G-06

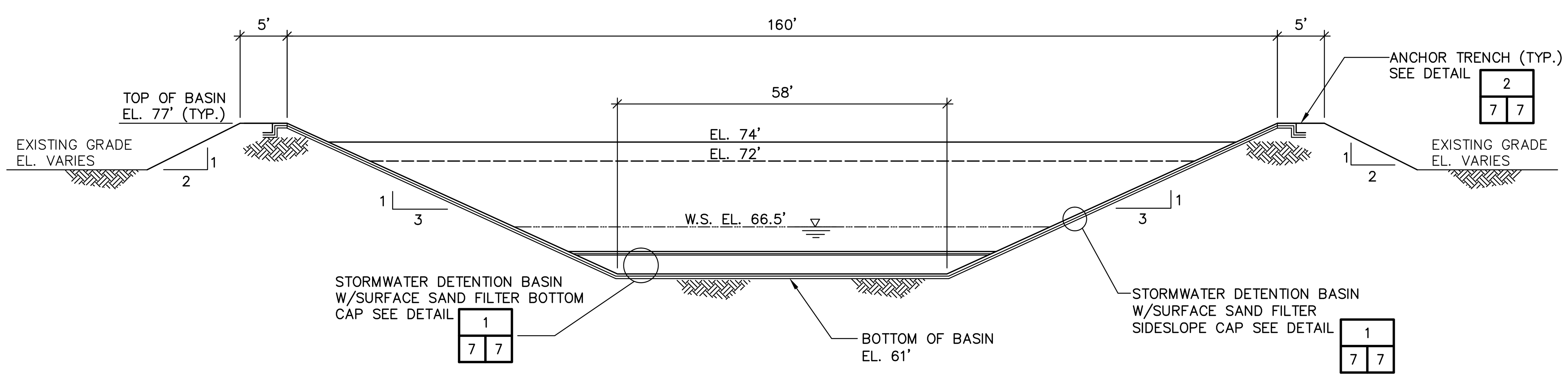
Sheet 6 of 9



STORMWATER DETENTION BASIN W/SURFACE SAND FILTER

SECTION 1 5 7

NOT TO SCALE



STORMWATER DETENTION BASIN W/SURFACE SAND FILTER

SECTION 2 5 7

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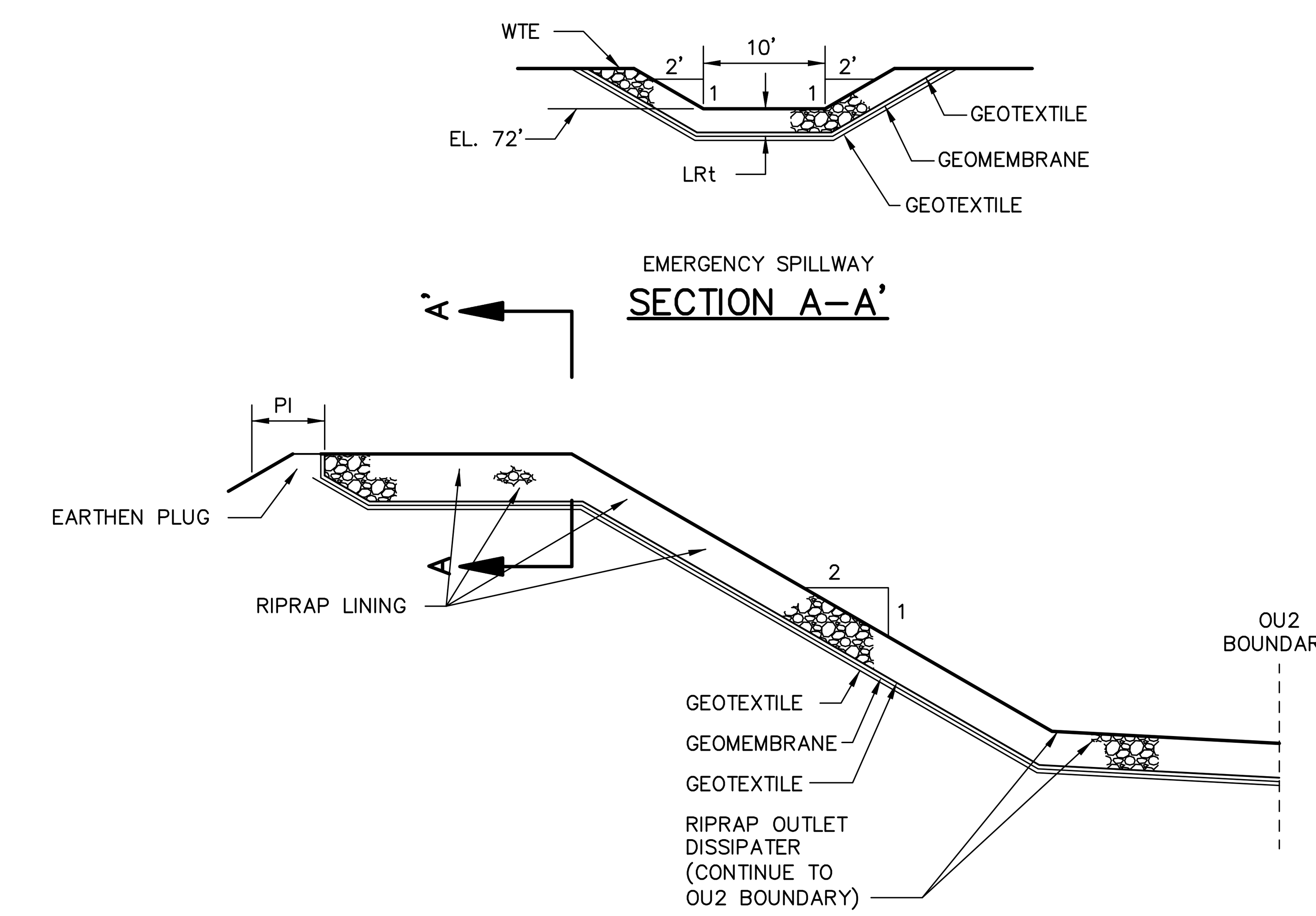

EMERGENCY SPILLWAY DETAIL 3 5 7

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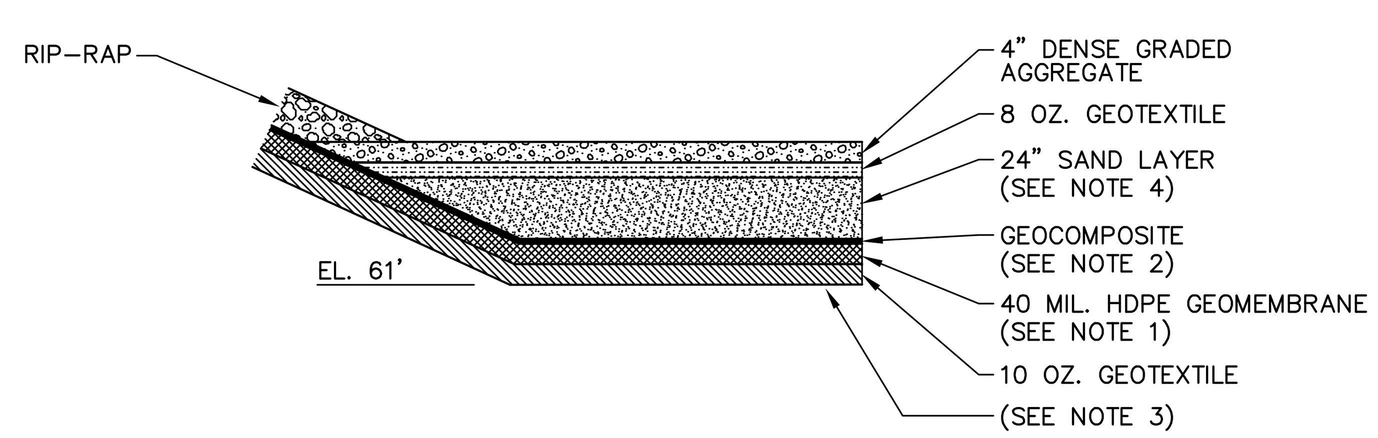
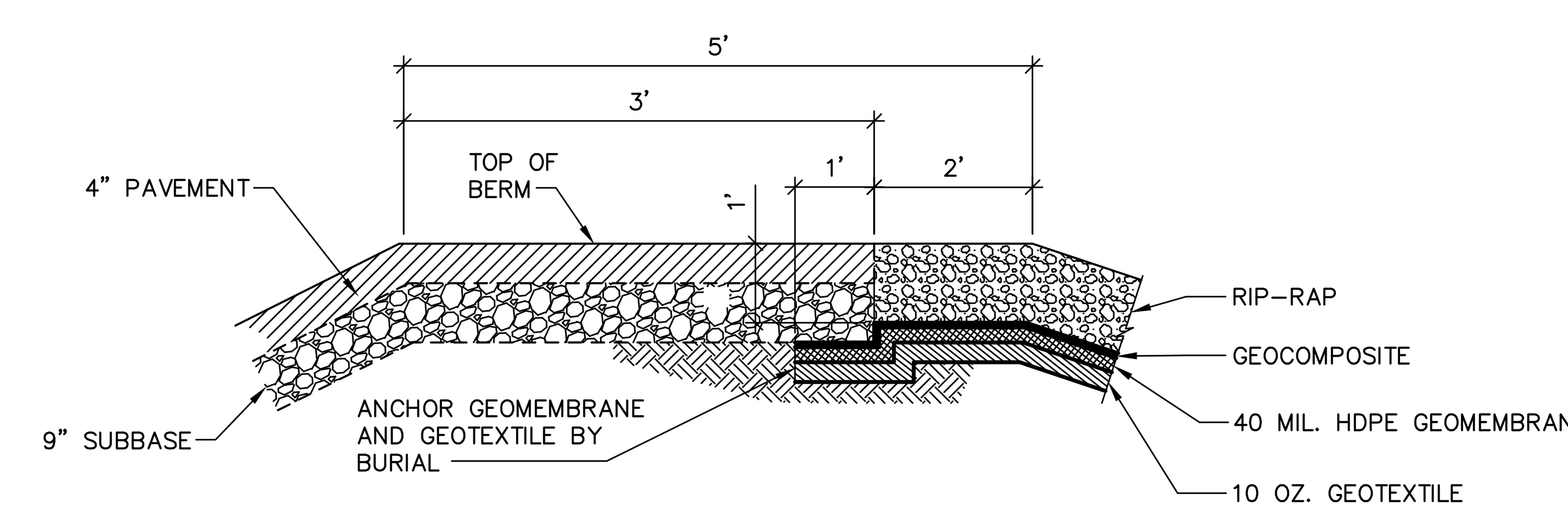


STORMWATER DETENTION BASIN W/SURFACE SAND FILTER
SIDESLOPE AND BOTTOM CAP DETAIL 1 7 7

NOT TO SCALE

NOTES:

1. SMOOTH GEOMEMBRANE INSTALLED ON BASIN BOTTOM, AND TEXTURED GEOMEMBRANE ON SIDESLOPES.
2. GEOCOMPOSITE HAS A MINIMUM TRANSMISSIVITY OF 1×10 m2/SEC^{4} AS MEASURED USING WATER AT 20°C AT A GRADIENT OF 0.1, UNDER CONFINING PRESSURE OF 10,000 PSF, BETWEEN STAINLESS STEEL PLATES, AND HAS MINIMUM 6 OZ. NON-WOVEN GEOTEXTILE BONDED TO BOTH SIDES OF THE HDPE GEONET CORE.
3. A SAND LEVELING LAYER ADDED WHEN BEDROCK WAS EXCAVATED TO ESTABLISH A SMOOTH SURFACE ON WHICH TO DEPLOY THE GEOSYNTHETICS.
4. SAND LAYER WITHIN THE SAND BED ZONE MEETS THE SPECIFICATIONS FOR CLEAN MEDIUM AGGREGATE CONCRETE SAND IN ACCORDANCE WITH AASHTO M-6 OR ASTM C-33. SAND WITHIN THE FOREBAY ZONES IS CLEAN SAND FREE OF ORGANIC MATERIAL AS APPROVED BY THE ENGINEER.



ANCHOR TRENCH DETAIL 2 7 7

NOT TO SCALE

RECORD DRAWINGS

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Drawn by: CD | Date:
Reviewed by: BG | Date:
Approved by: | Date:
File Name: G09-4553G009.DWG

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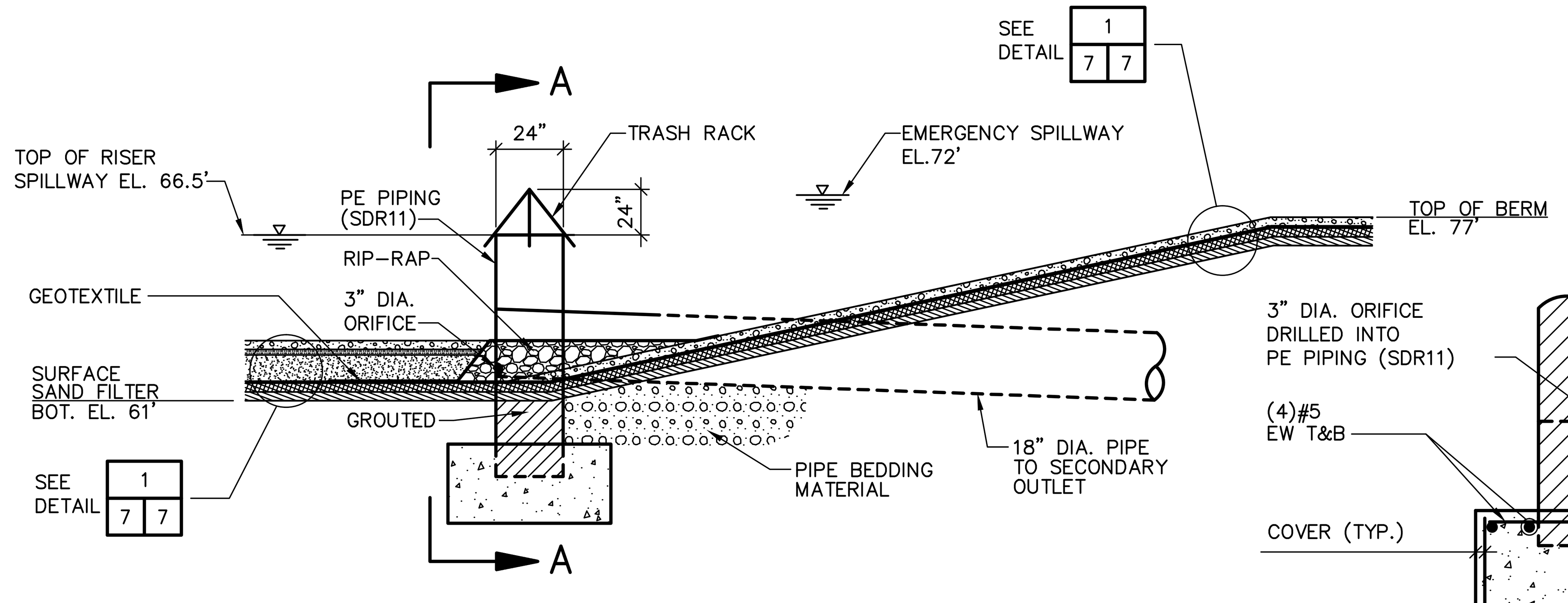
CORNELL-DUBILIER ELECTRONICS
SUPERFUND SITE OU2 SOILS REMEDIATION
SOUTH PLAINFIELD, NEW JERSEY

MISCELLANEOUS DETAILS – 2

G-07

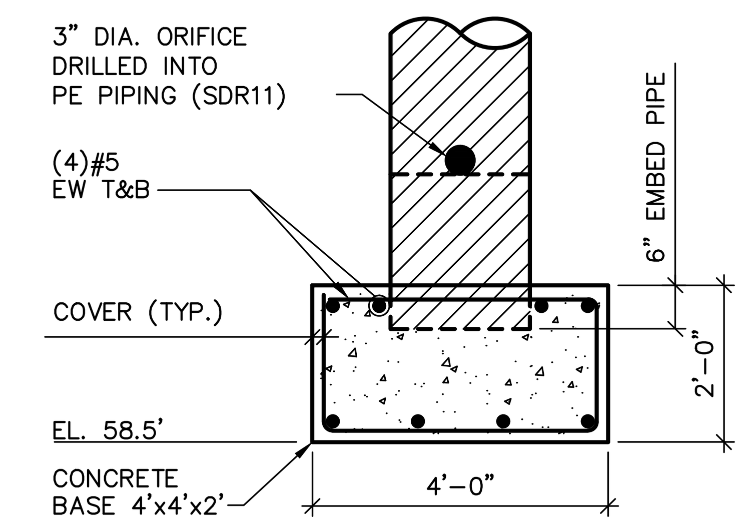
Sheet 7 of 9

User:DEWYER Spec:PIRNIE STANDARD File:G:\Projects\4553033\CADD\SOILS REMEDIATION\FINAL LAND USE\RECORD DRAWINGS\GEN\G09-4553G009.DWG Scale:1:1 Date:09/13/2013 Time:15:15 Layout:Layout1



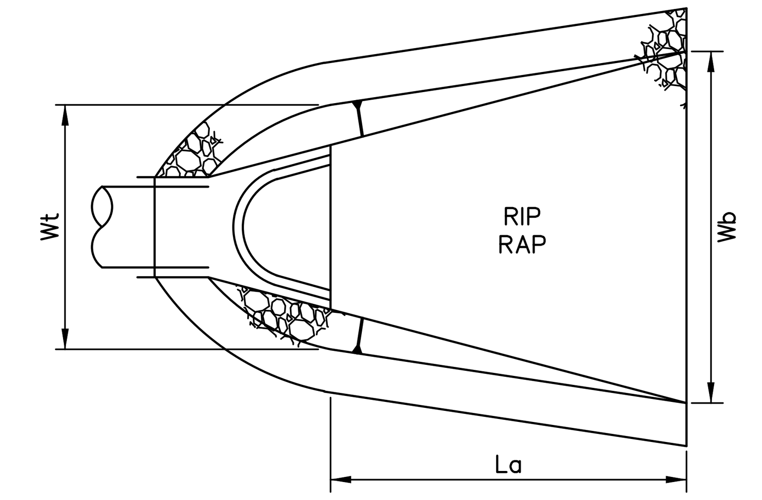
STORMWATER DETENTION BASIN W/SURFACE SAND FILTER OUTLET STRUCTURE DETAIL (1 / 5 8)

NOT TO SCALE



SECTION A–A

NOT TO SCALE



OUTLET NO.	APRON LENGTH La (FT)	APRON TOP WIDTH Wt (FT)	APRON BOTTOM WIDTH Wb (FT)	INVERT ELEVATION (FT)	BACKFLOW PREVENTOR
POND INLET 1	32.2	9.0	41.2	68.5±	NO
POND INLET 2	15.8	4.5	20.3	67.3±	NO
POND INLET 3*	29.3	7.5	36.8	61.3±	YES
POND INLET 4	27.6	7.5	35.1	63.9±	YES
POND INLET 5	24.0	6.0	30.0	67.4±	NO
POND OUTLET**	26.9	4.5	31.4	61.0	YES

** (SEE NOTE 2 & 3)

* SEE DETAIL 6 / 5 8

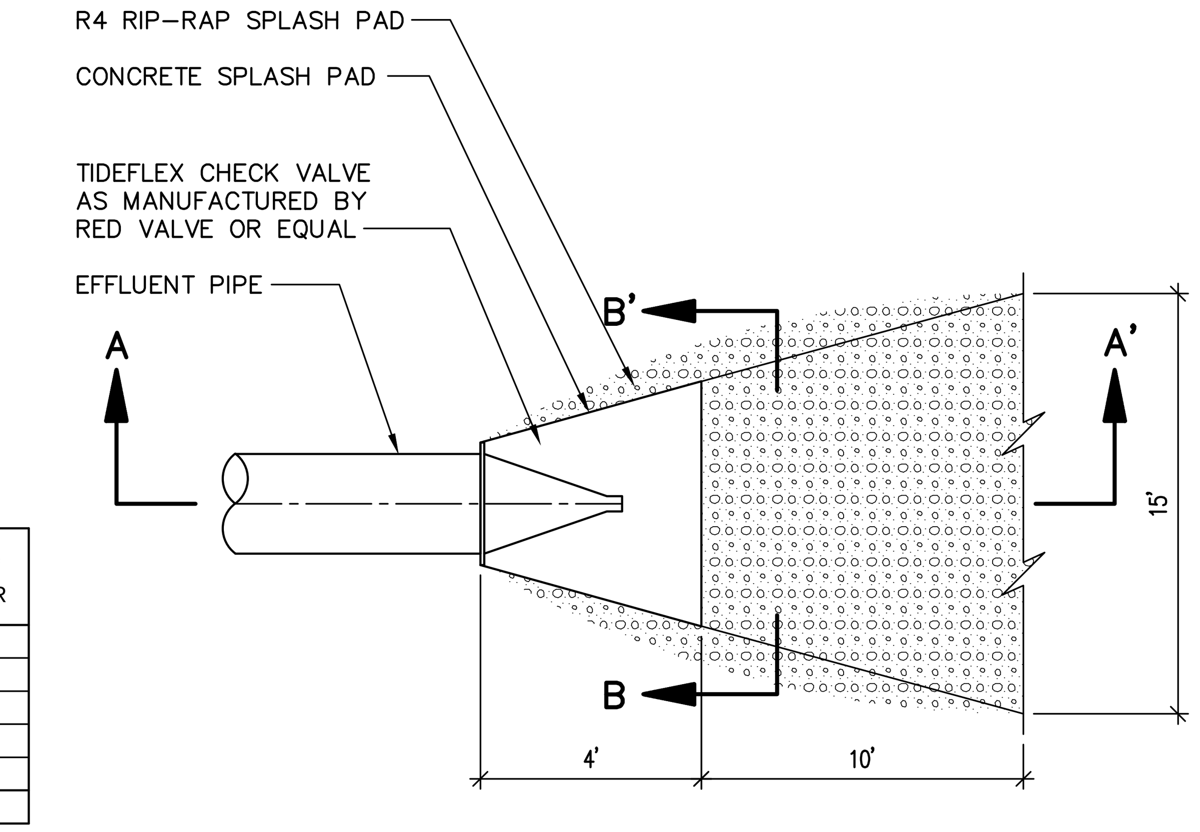
NOTE:

1. SEE SPECIFICATIONS FOR D50 STONE SIZE AND THICKNESS.
2. POND OUTLET APRON HAS A 3 FOOT DEEP BY 3 FOOT WIDE RIP-RAP TOE WALL AT THE EDGE OF APRON.
3. POND OUTLET PIPE INCLUDES TIDEFLEX CHECK VALVE AS MANUFACTURED BY RED VALVE OR EQUAL.

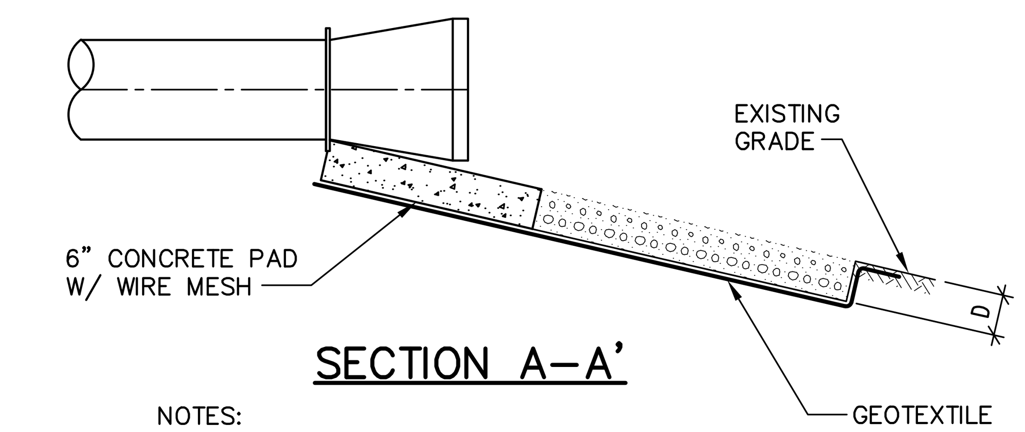
INLET/ OUTLET DETAIL (3 / 5 8)

NOT TO SCALE

(TAKEN FROM FIGURE 12-1 FROM NEW JERSEY'S STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL)



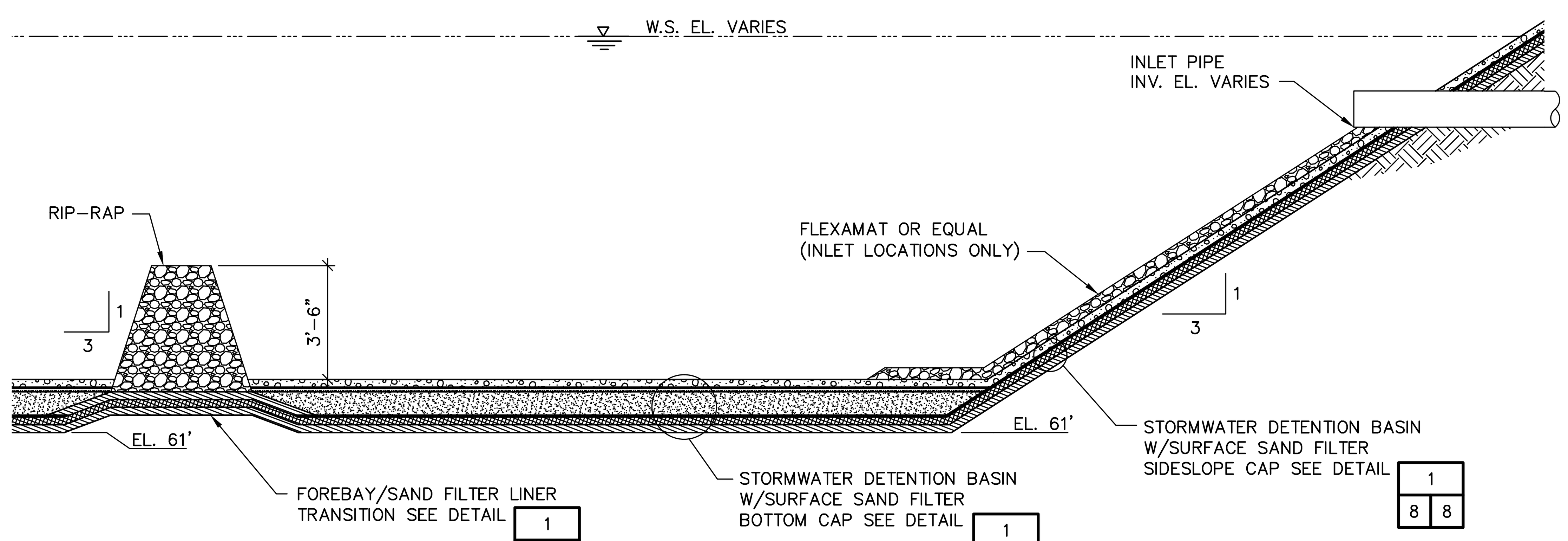
PLAN



SECTION A–A'

NOTES:

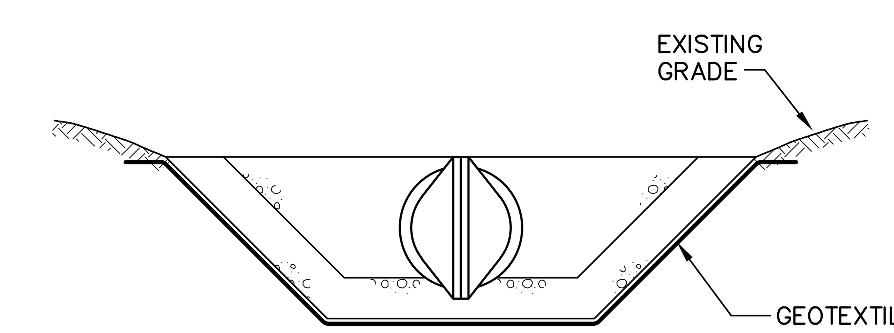
1. D = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6 INCHES.
2. 6" SPLASH PAD – WWF 6x6 – W6.5xW6.5
3. COVER – 3" CLEAR WHEN CAST AGAINST EARTH, 2" CLEAR OTHERWISE.
4. CONCRETE – COMPRESSIVE STRENGTH 4000 psi.
5. REBAR – ASTM A615.



FOREBAY DETAIL (2 / 5 8)

NOT TO SCALE

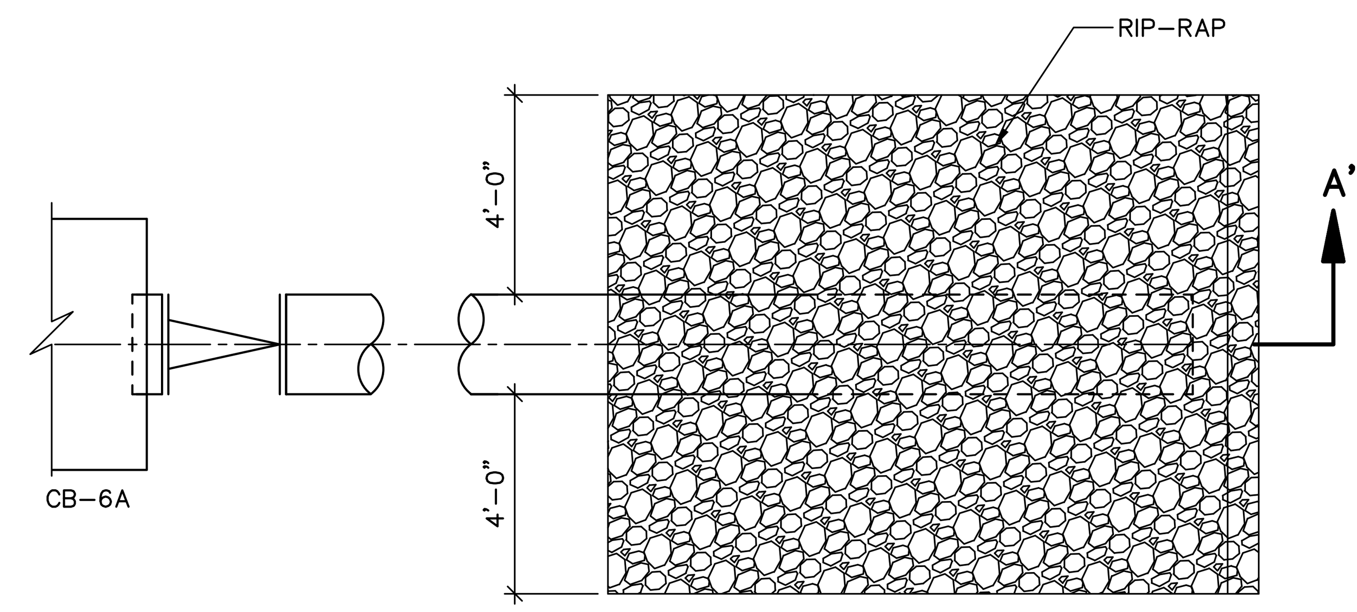
(REFER TO NEW JERSEY STANDARDS FOR SOIL EROSION AND SEDIMENT CONTROL, APPENDIX: STRUCTURAL GUIDELINES FOR BASIN SLOPES AND OUTLET STRUCTURES.)



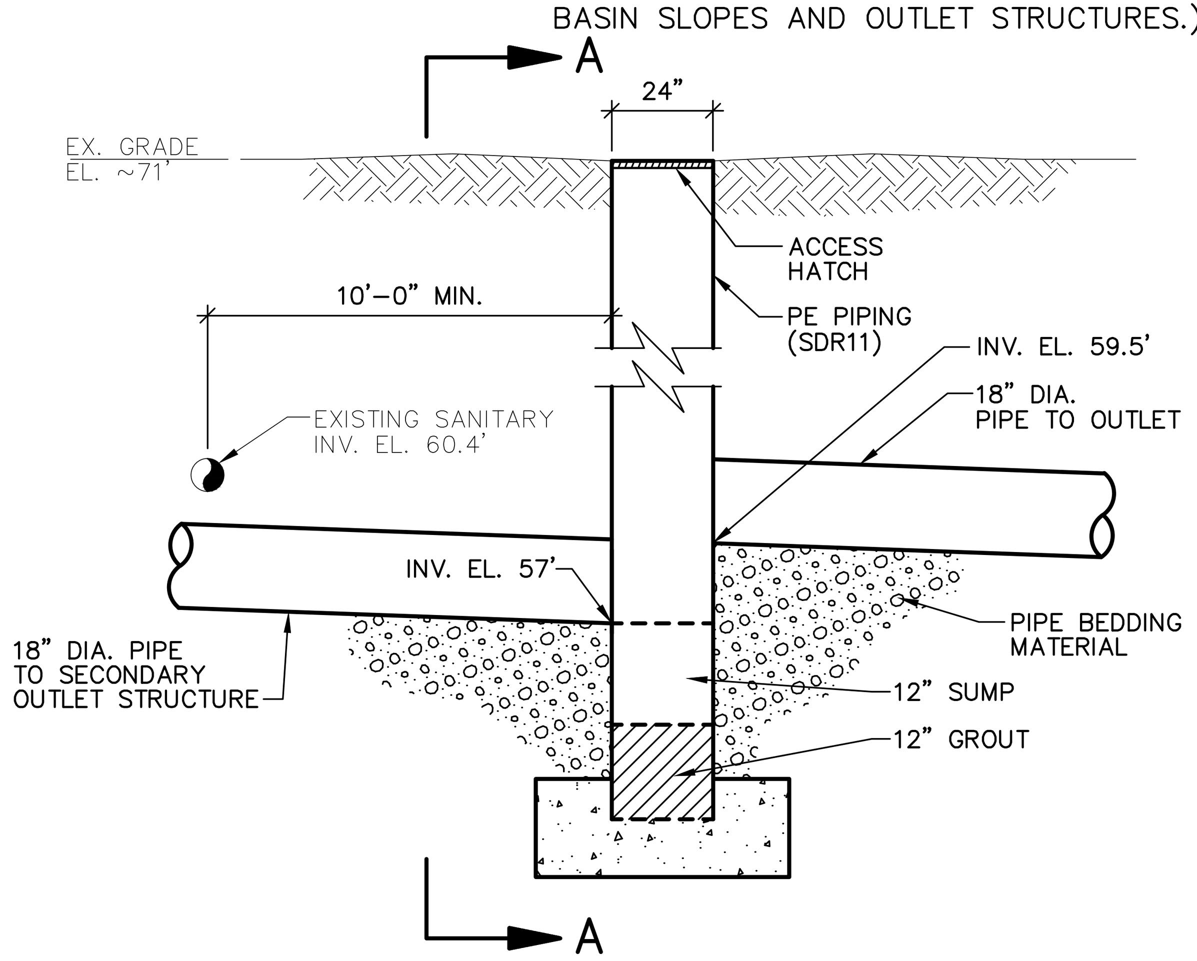
SECTION B–B'

OUTLET WITH BACKFLOW PREVENTER DETAIL (4 / 5 8)

NOT TO SCALE

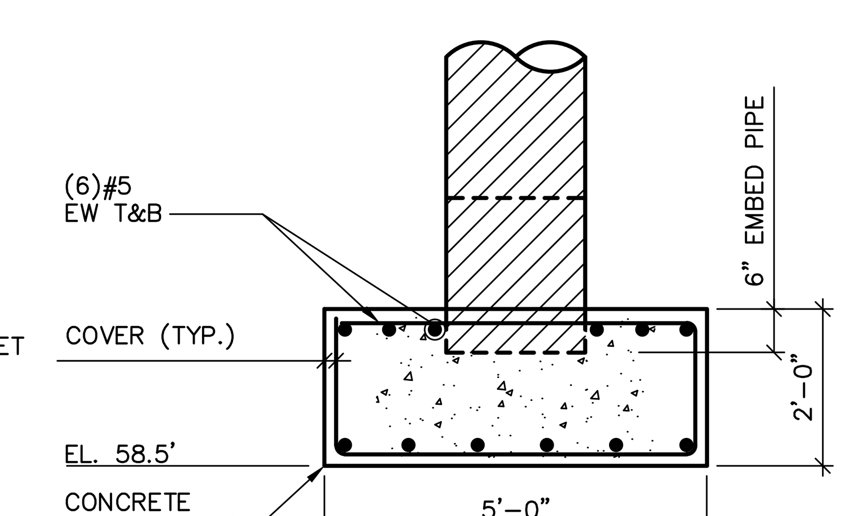


PLAN



SECONDARY OUTLET STRUCTURE DETAIL (5 / 5 8)

NOT TO SCALE



SECTION A–A

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RECORD DRAWINGS

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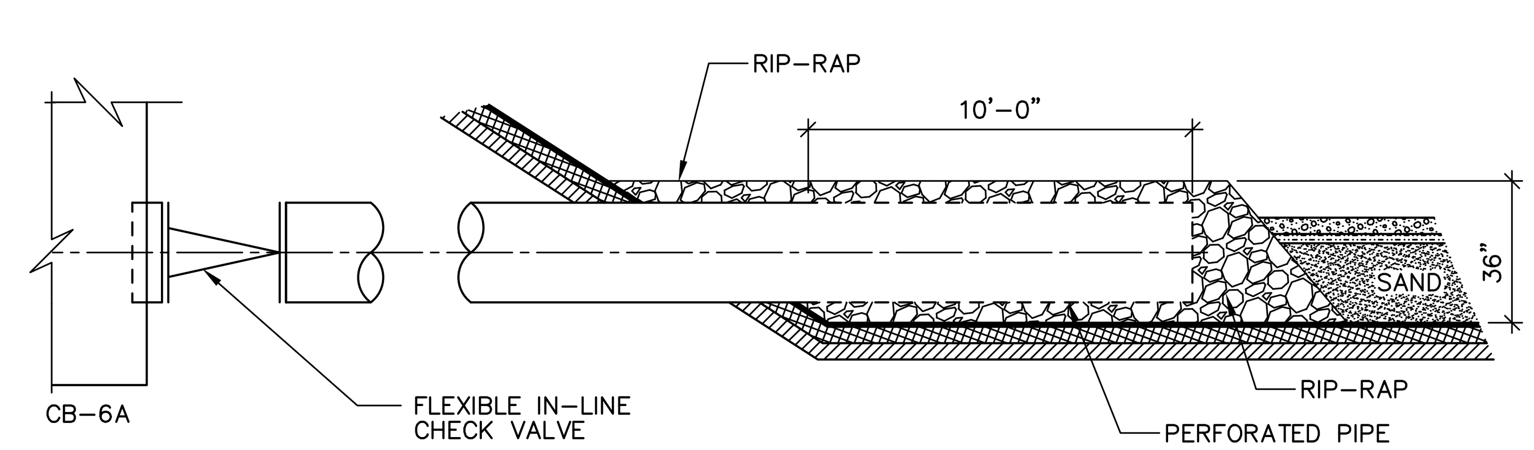
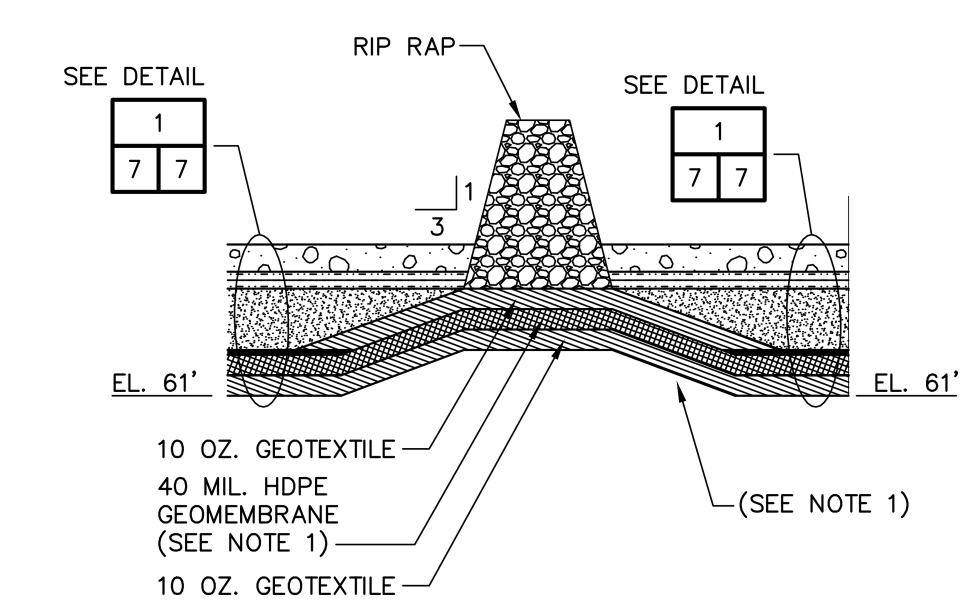
Date 9/13 By LB / ARCADIS



SECTION A–A'

INLET NO. 3 DETAIL (6 / 5 8)

NOT TO SCALE



FOREBAY/SAND FILTER LINER TRANSITION DETAIL (1 / 8 8)

NOT TO SCALE

NOTES

1. SMOOTH GEOMEMBRANE INSTALLED ON DETENTION BASIN BOTTOM, AND TEXTURED GEOMEMBRANE ON SIDESLOPES.
2. A SAND LEVELING LAYER ADDED WHEN BEDROCK WAS EXCAVATED TO ESTABLISH A SMOOTH SURFACE ON WHICH TO DEPLOY THE GEOSYNTHETICS.

U.S. Army Corps of Engineers KANSAS CITY DISTRICT

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1	RECORD DRAWINGS	9/13	CTD

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Approved by: | Date:
File Name: G10-4553G010.DWG

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ARCADIS
ARCADIS-US, INC. 44 SOUTH BROADWAY, 13th FLOOR WHITE PLAINS, NEW YORK 10601

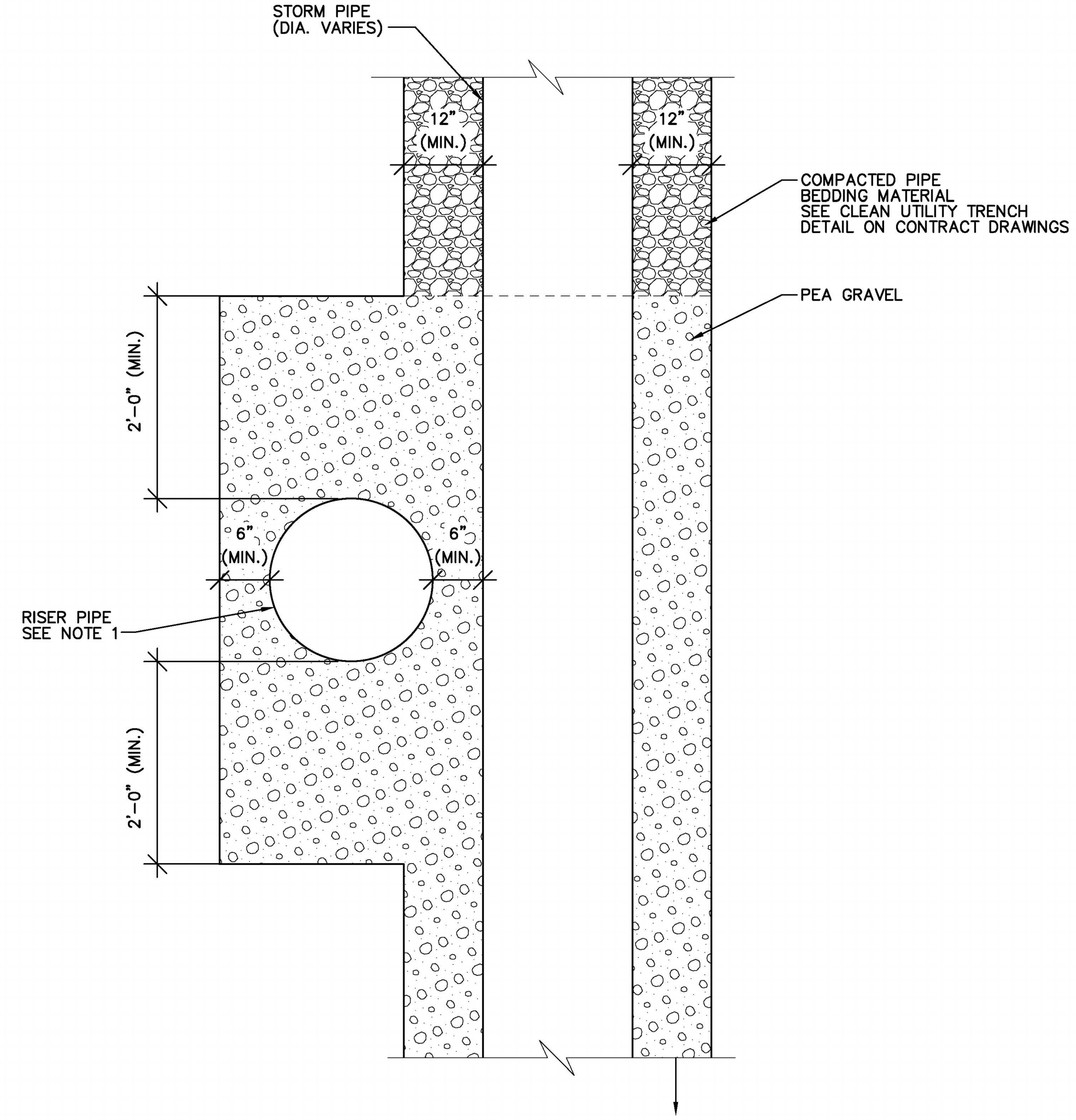
CORNELL-DUBILIER ELECTRONICS SUPERFUND SITE OU2 SOILS REMEDIATION SOUTH PLAINFIELD, NEW JERSEY

MISCELLANEOUS DETAILS – 3

G-08

Sheet 8 of 9

User:DEWYER Spec:PIRNIE STANDARD File:G:\Projects\4553033\CADD\SOILS REMEDIATION\FINAL LAND USE\RECORD DRAWINGS\GEN\G10-4553G010.DWG Scale:1:1 Date:09/13/2013 Time:15:15 Layout:Layout1



PARTIAL PLAN
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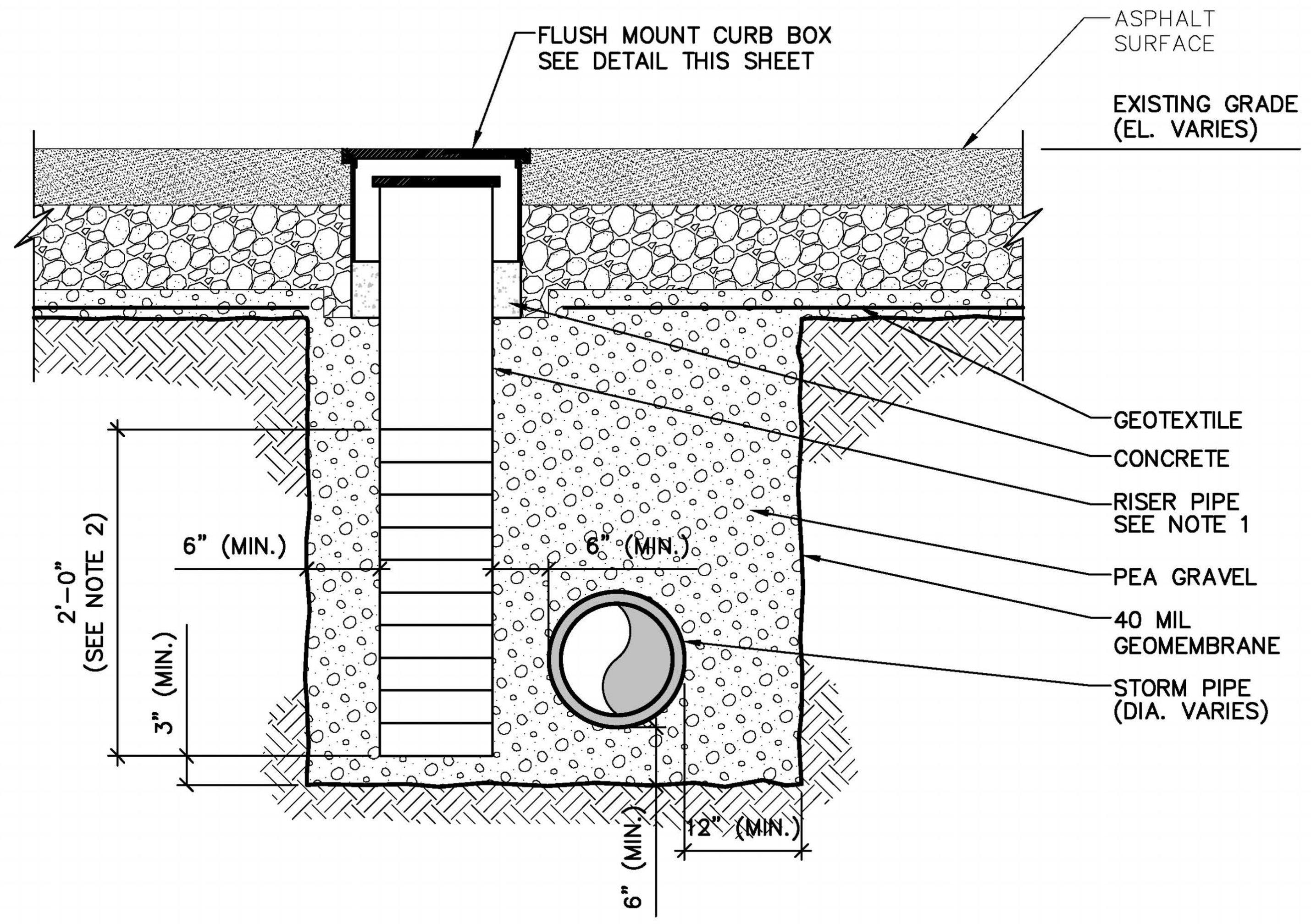

SECTION A–A
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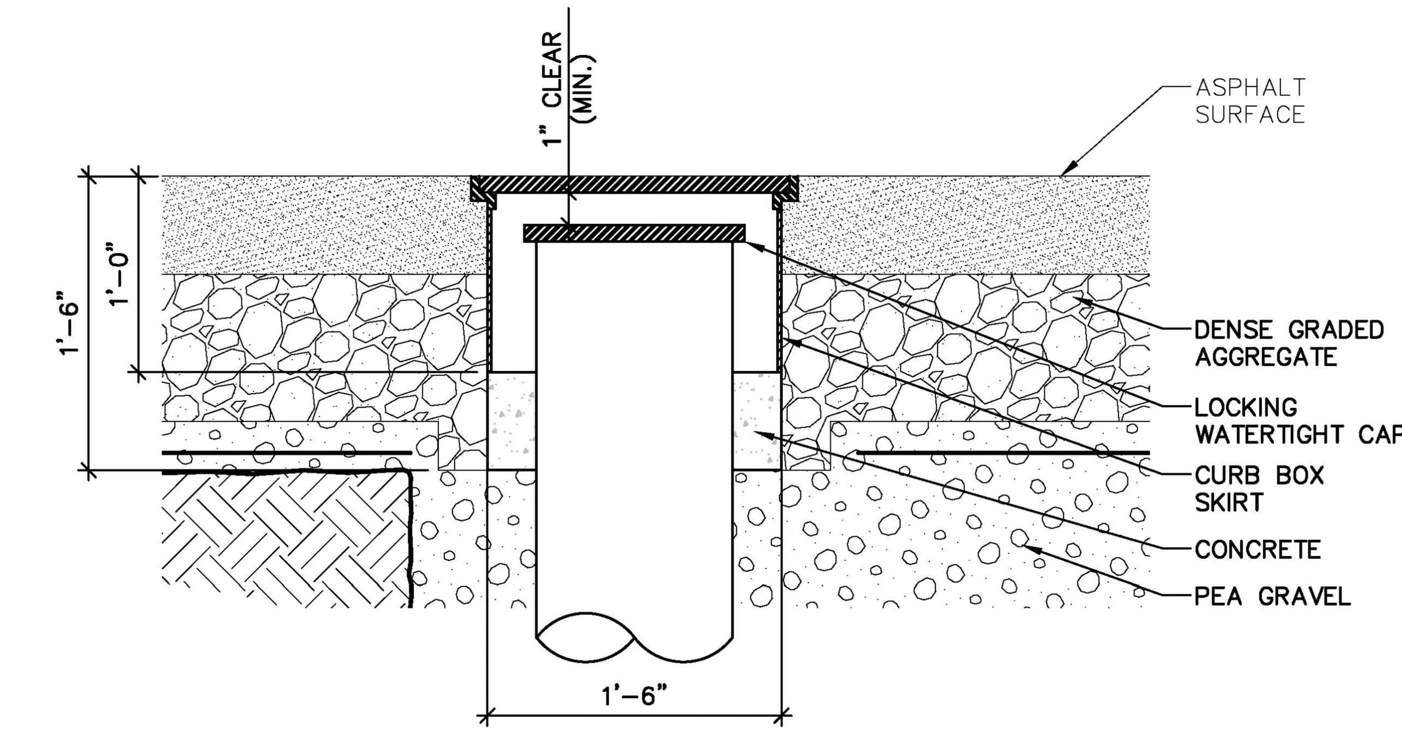

FLUSH MOUNT CURB BOX DETAIL
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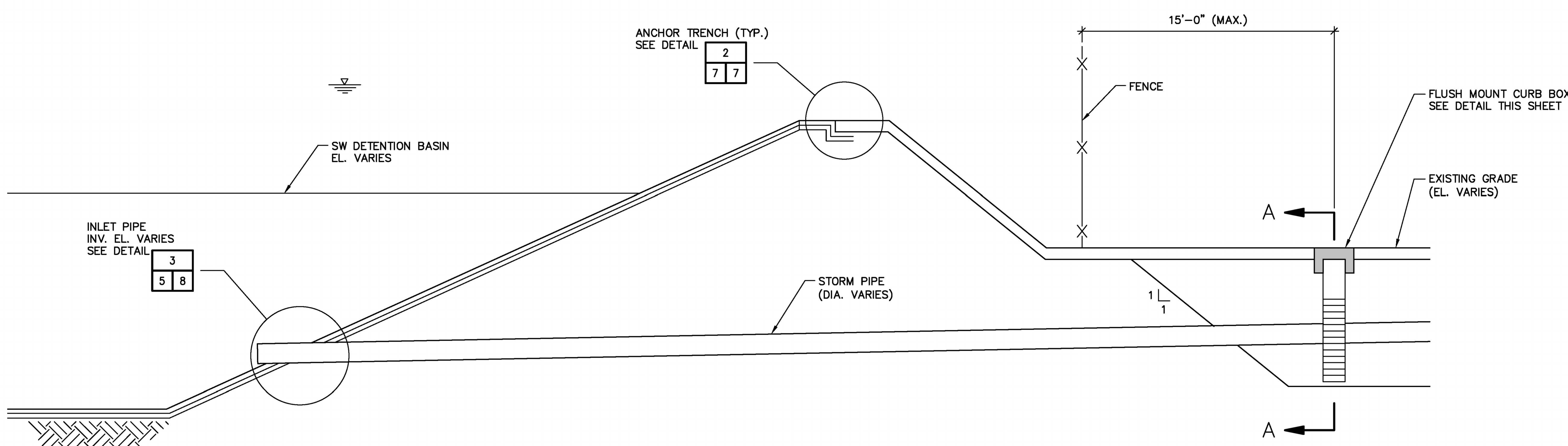

SECTION
NOT TO SCALE

NOTES:

1. 12" DIA. SCH. 40 PVC RISER PIPE.
2. WELL SCREEN HAS SLOT THICKNESS OF 0.05"

RECORD DRAWINGS

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KANSAS CITY DISTRICT

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ARCADIS-US, INC.
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WHITE PLAINS, NEW YORK 10601

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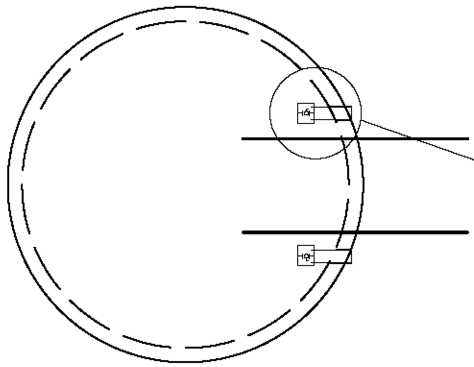
Reviewed by: BG Date:
Approved by: Date:
File Name: G11-4553G011.DWG

CORNELL-DUBILIER ELECTRONICS
SUPERFUND SITE OU2 SOILS REMEDIATION
SOUTH PLAINFIELD, NEW JERSEY

MISCELLANEOUS DETAILS – 4

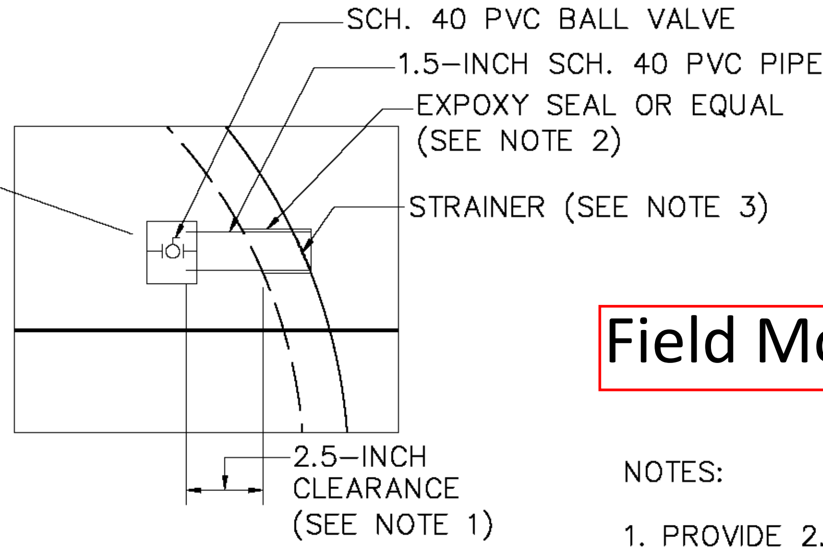
G–09

Sheet 5 of 9



PLAN VIEW

NOT TO SCALE



ENLARGED VIEW

NOT TO SCALE

Field Modification CB-12

NOTES:

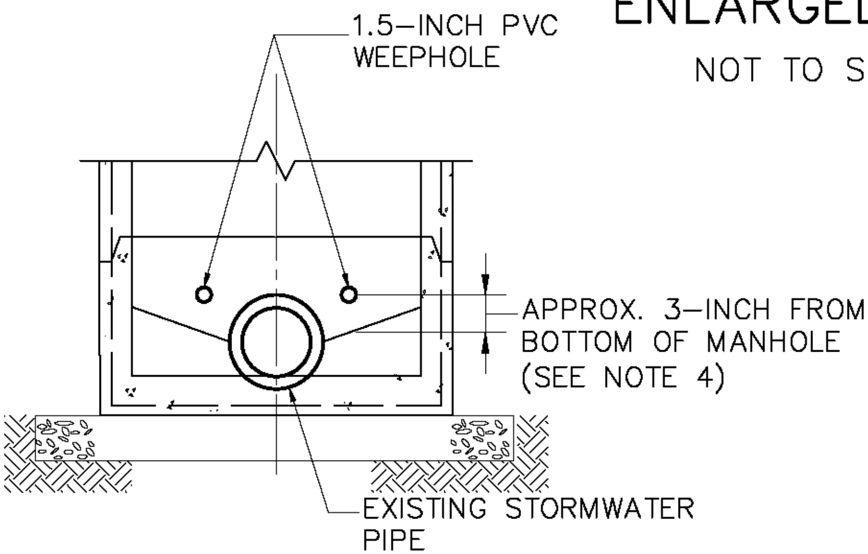
1. PROVIDE 2.5–INCH CLEARANCE OF PVC PIPE TO INSTALL 1.5–INCH PVC SLIP BALL VALVE. THREAD CONNECTION PREFERRED.

2. THE ANNULAR SPACE BETWEEN THE PVC PIPE AND THE CONCRETE MANHOLE SHALL BE SEALED WITH POLYURETHANE INJECTION GROUT, EPOXY OR EQUAL TO PROVIDE A TIGHT SEAL.

3. PROVIDE A STAINLESS STEEL 30 MESH (1/64th INCH) LINE STRAINER OR EQUAL THAT FITS OVER 1.5–INCH NPT.

4. LOCATION OF WEEP HOLES TO BE COORDINATED IN THE FIELD WITH THE ENGINEER. WEEP HOLES TO BE SITUATED AT LOWEST ELEVATION POSSIBLE WHILE ALLOWING SUFFICIENT OPERATION OF THE BALL VALVE.

5. PVC VALVE TO CONSIST OF THE FOLLOWING (OR EQUAL):
   - PVC SCHEDULE 40 BALL VALVE WITH SWING HANDLE
   - THREADED CONNECTION



SECTION VIEW

NOT TO SCALE

Approved	Date	Description	Symbol

Revisions

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
KANSAS CITY DISTRICT
KANSAS CITY, MISSOURI

MALCOLM PIRNIE

MALCOLM PIRNIE, INC.
44 SOUTH BROADWAY
WHITE PLAINS, NY 10601

Designed by: JTS	Date: 06/26/13	Approved by:	Date:
Drawn by: KBI	Date: 06/26/13	File Name:	
Reviewed by: JTS	Date: 06/26/13		

CORNELL–DUBILIER ELECTRONICS
SUPERFUND SITE OU–2 SOILS REMEDIATION
SOUTH PLAINFIELD, NEW JERSEY

BALL VALVE INSTALLATION PLAN

FIGURE 1

APPENDIX C

U.S. Army Corps of Engineers
Kansas City District

Design Analysis Report Operable Unit 2 – Storm Water Management

Cornell-Dubilier Electronics Superfund Site
South Plainfield, NJ

USACE Contract No. W912DQ-06-D-0006
Task Order No. 0001

June 2008

Prepared by:
Malcolm Pirnie, Inc.
1900 Polaris Parkway, Suite 200
Columbus, OH 43240

INDEPENDENT ENVIRONMENTAL ENGINEERS, SCIENTISTS AND CONSULTANTS

MALCOLM PIRNIE

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2. Storm Water System Design 2-1

2.1. Storm Water System Design Components ... 2-2
2.1.1. Catch Basins ... 2-2
2.1.2. Piping ... 2-2
2.1.3. Extended Detention Basin ... 2-3
2.1.3.1. Basin Outlet Structure ... 2-3
2.1.3.2. Basin Forebays ... 2-4
2.1.3.3. Conduit Outlet Protection ... 2-4

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Attachments

A. PondPack Model Output

B. Pre-Development Calculations

C. Catch Basin Calculations

D. Piping Calculations

E. Conduit Outlet Protection Calculations

1. Introduction

The former Cornell – Dublier Electronics property is currently a superfund site in South Plainfield, NJ. The site has been contaminated due to the improper disposal of manufactured components on site. The contaminated soil will be decontaminated and once the remediation is completed the entire site will be paved. Malcolm Pirnie has designed a storm water system to convey water from the site without impacting the surrounding area. The design of the system follows the State of New Jersey's Standards for Soil Erosion and Sediment Control as well as the New Jersey Storm Water Best Management Practices Manual.

1.1. Extended Detention Basin Location

One of the main issues to be resolved with this project was the location of an extended detention basin (basin). There were many factors for determining the location of the basin. Originally it was determined that the basin would not be placed over areas of contaminated soil. The natural grading of the site slopes to the north and to the east toward the Bound Brook so the optimal place to locate the basin is along the northern boundary of the site. Several potential basin locations were evaluated south of the rail system and to the west of the major contaminated areas. Areas in the northwest corner of the site contained uncontaminated areas but the bedrock was very shallow. Because of the shallowness of the bedrock in these locations, it was apparent that avoiding excavation in contaminated areas would necessitate significant rock removal. It was determined that the basin would be placed in the northeast corner of the site, where bedrock was deepest. The location is in a contaminated area but it was deemed the best choice in terms of constructability. The location of the basin can be viewed on sheet G-12.

2. Storm Water System Design

The “New Jersey Storm Water Best Management Practices Manual (NJSBMPM), was used for the development of the storm water system. The storm water system consists of catch basins, piping, an extended detention basin, and a basin outlet structure.

All the various components of the developed storm water system were placed into a computer model called PondPack. Sub-areas of storm water collection to each catch basin were input into the model as well as sheet flow and channel flow lengths. Piping reach distances and estimated pipe sizes as well as the size and volume of the basin were also input into the model. The initial basin volume was estimated using an input hydrograph generated for the preliminarily storm water network following the TR-55 tabular hydrograph method. Note catch basins CB-23 and CB-24 are not included in the model because they are solely designed to assist in cleaning the system and have no storm water responsibility.

The model was conducted using the 2, 5, 10, 25, 50, 100 year – 24 hr type III storm events. From the NJSBMPM, the outlet structure for the basin was designed so post-development peak runoff rates for the 2, 10 and 100 year storm events were 50, 75, and 80 percent, respectively, of the pre-development peak runoff rates. Output from the PondPack model is attached in attachment A.

Pre-development runoff rates were calculated using the Rational Method and assuming conservatively that the pre-developed area was entirely grass. Pre-development calculations are attached in attachment B. Equations for the pre-development calculations were taken from the PondPack user’s guide. Table 2.1 shows the flows that will have to be matched for the post-construction outlet structure.

Table 2.1

Storm Frequency	Pre-Development Peak Runoff (Q_i)	Post-Development Peak Design Flow (Q_i)
2–yr	20.2 cfs	10.1 cfs
10–yr	27.4 cfs	20.5 cfs
100–yr	37.8 cfs	30.2 cfs

2.1. Storm Water System Design Components

2.1.1. Catch Basins

A total of 22 catch basins were used for the storm water configuration at the site. A catch basin detail is presented on sheet G-14. There are three types of catch basins which will be constructed. The first type is a general catch basin which will be constructed level in low areas of the site. The second type of catch basin contains angled grates. The catch basin grate is angled to ensure that flow along the low area troughs in the pavement will enter the catch basin. If the catch basin were constructed flat the flow may concentrate along the sides of the drain and flow past the catch basin. The third type of catch basin is a general curb inlet which will be installed in some perimeter areas of the site. A catch basin network schedule is located on sheet G-12. Catch basin network calculations are attached in Attachment C

2.1.2. Piping

The piping for the storm water collection system is HDPE pipe. Because it is fusion welded, HDPE pipe is virtually leak proof, therefore mitigating the potential for infiltration of surface water into contaminated soils. Invert elevations for piping entering and leaving catch basins can be found on the catch basin schedule. Catch basin network piping invert elevations were determined from the assumption that at least 1 foot of pipe cover material and 1.25 feet of pavement material would need to be installed over the pipe.

The sizing of the storm water pipe was accomplished by using the 25-year design flow (cfs) from the PondPack output along with user-defined pipe geometries. A manning's (n) roughness number of 0.009 was used for solid HDPE pipe. Calculated flow relationships were determined assuming a ¾ full pipe. From the calculation a final design diameter for the piping was obtained. A spreadsheet summarizing the piping calculations is attached in Attachment D. A pipe size schedule is located on sheet G-12.

2.1.3. Extended Detention Basin

The basin has 3:1 inner side slopes, a 5-foot bench on top of the berm and 2:1 side slopes to grade on the perimeter. The basin will be lined with 40-mil LLDPE flexible membrane liner to mitigate potential infiltration of surface water into contaminated soils. The basin will also have a 12-inch sand layer and two sets of geotextiles (one as a cushion layer to protect the geomembrane, the other as an indicator layer to prevent accidental damage during maintenance activities. A detail of the cross-section of the basin with layer details is on sheet G-16.

2.1.3.1. Basin Outlet Structure

The basin outlet structure consists of a multi-stage structure that includes a low-flow orifice and a standpipe overflow or "primary discharge." The low-flow orifice is a 6-inch diameter opening at the base of the standpipe. The standpipe itself will be a 5-foot high (elevation 65.0), 18-inch diameter HDPE riser equipped with a trash rack to prevent clogging. The low-flow orifice controls the 2-yr storm event and the primary spillway controls the 10-yr / 24-hr storm event. An emergency spillway is located 8 feet above the bottom of the basin (elevation 68.0). The emergency spillway elevation is set above the 100-yr / 24-hr storm event elevation. The outlet structure meets the "Standards for Soil Erosion and Sediment Control in New Jersey, Appendix A10 - Modified Structural Guidelines for Storm Water Management Basins". A basin outlet detail can be found on

Sheet 17. Output from the PondPack model based on the basin outlet structures is summarized in Table 2-2 below.

Table 2.2

Storm Frequency	Post-Development Peak Required Flow (Q_i)	Model Output Flow
2–yr	10.1 cfs	3.5 cfs
10–yr	20.5 cfs	13.1 cfs
100–yr	30.2 cfs	27.6 cfs

2.1.3.2. Basin Forebays

In the NJSBMPM it states that a 24-hour detention time is required in an extended detention basin in order to achieve a 60 percent TSS removal rate. In order to achieve this percentage, a minimum of 10 percent of the storm water quality design storm runoff volume must be retained for the 24-hour time period. In order to retain the water quality volume from a storm event forebays will be constructed at the conduit inlets of the basin for sediment removal. The definition of a storm water quality design storm is a 2-hr storm with a rain total of 1.25 inches. The volume of the quality design storm was determined from the PondPack data and used in the design of the forebays. The forebays will be constructed with a retained volume greater than 10 percent of the quality design storm volume.

2.1.3.3. Conduit Outlet Protection

Pipe inlets to the basin are required to have conduit outlet protection. From the Standards for Soil Erosion and Sediment Control in New Jersey Manual, the need for conduit protection is determined by comparing the allowable velocity for the soil onto which the conduit is discharging to the velocity in the conduit. Because the velocities from the inlet pipes to the basin are greater than the velocity allowable for sand, outlet protection is needed. Calculations for the required size of the outlet protection apron and riprap size requirements as well as equations used from section 12-1 of the Sediment Control Manual are attached as Attachment E.

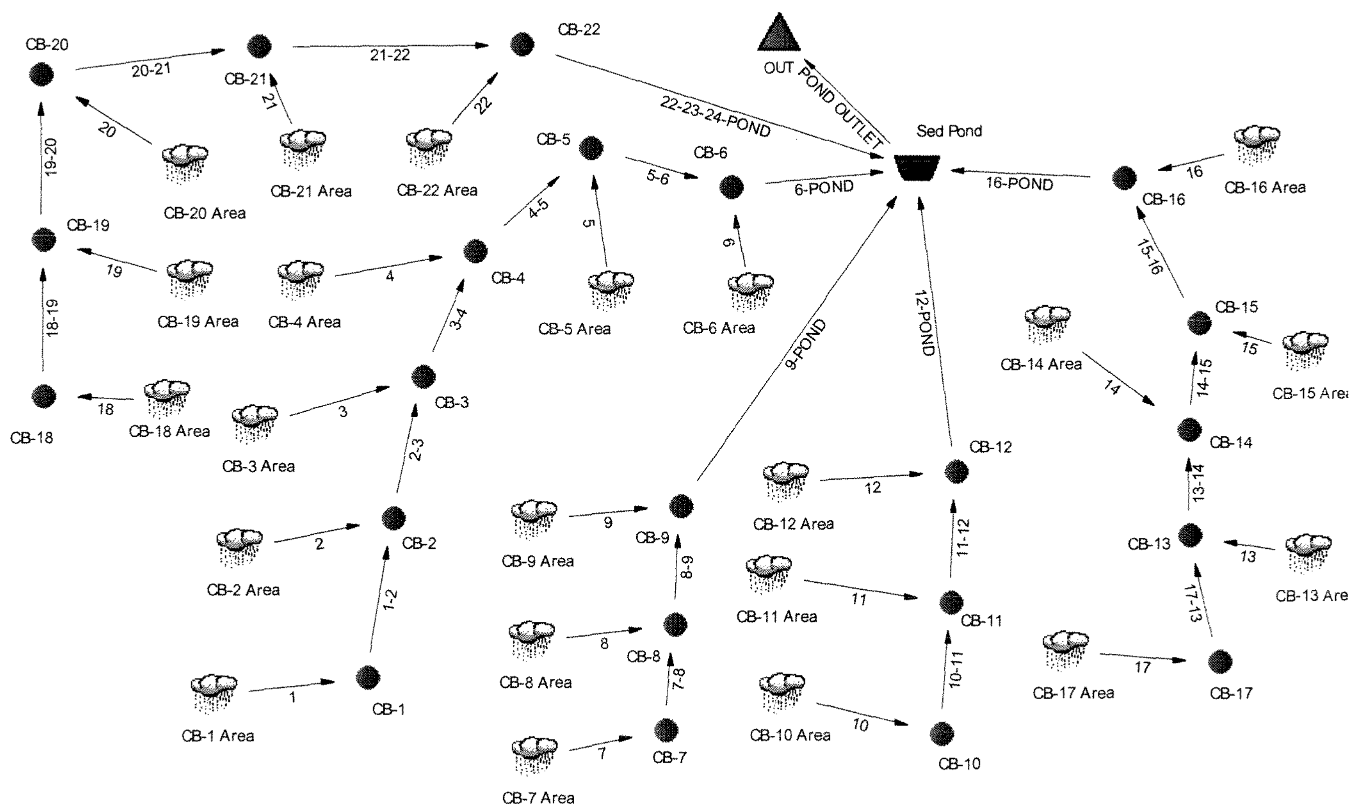
3. Summary

Malcolm Pirnie Inc designed a storm water system for the former Cornell-Dublier electronics manufacturing site that meets the requirements for the State of New Jersey's Standards for Soil Erosion and Sediment Control as well as the New Jersey Storm water Best Management Practices Manual.

Pre-development flows from the site were calculated and used to determine the required flows for post-development conditions. Storm water components were developed and input into a storm water modeling system and an outlet structure was designed to meet the required post-development flows. Storm water modeling was performed using PondPack and the modeling output meets the requirements for post-development.

Storm water piping was sized based on calculated flows from the modeling system. Velocities in the pipes are sufficient to move any grit or debris caught in the system. Conduit outlet protection calculations were performed to determine the required dimensions of riprap aprons to be used at pipe outlets. It has been recommended that HDPE Pipe and LLDPE flexible membrane liner be used in the storm water system to mitigate the potential for infiltration of surface water into contaminated soils.

Attachment A
PondPack Model Output



CB-20
CB-21
CB-22
OUT
POND OUTLET
Sed Pond
20-21
21-22
22-23-24-POND
21
22
20
19-20
CB-20 Area
CB-21 Area
CB-22 Area
CB-5
CB-6
5-6
6-POND
16-POND
16
CB-16
CB-16 Area
CB-19
19
CB-19 Area
4
CB-4 Area
CB-4
4-5
5
CB-5 Area
6
CB-6 Area
9-POND
12-POND
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CB-1 Area
8
CB-8 Area
CB-8
7-8
10-11
CB-10
10
CB-10 Area
CB-7
7
CB-7 Area

=========================
JOB TITLE
=========================

Project Date: 2/25/2008
Project Engineer: Gearing
Project Title: Cornell-Dubilier
Project Comments:
Superfund Site OU-2 Soils Remediation

MASTER DESIGN STORM SUMMARY

Network Storm Collection: South Plainfield

Return Event	Total Depth in	Rainfall Type	RNF ID
Dev 2	3.3000	Synthetic Curve	TypeIII 24hr
Dev 5	4.3000	Synthetic Curve	TypeIII 24hr
Dev 10	5.2000	Synthetic Curve	TypeIII 24hr
Dev 25	5.9000	Synthetic Curve	TypeIII 24hr
Dev 50	6.4000	Synthetic Curve	TypeIII 24hr
Dev100	7.5000	Synthetic Curve	TypeIII 24hr
Dev 1	1.2500	Time-Depth Curve	Gauged Rain

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
CB-1	JCT	2	.235		12.0960	2.53		
CB-1	JCT	5	.312		12.0900	3.31		
CB-1	JCT	10	.380		12.0930	4.01		
CB-1	JCT	25	.434		12.0960	4.56		
CB-1	JCT	50	.472		12.0960	4.95		
CB-1	JCT	100	.557		12.0960	5.80		
CB-1	JCT	1	.079		1.0860	2.75		
CB-1 AREA	AREA	2	.235		12.0960	2.53		
CB-1 AREA	AREA	5	.312		12.0900	3.31		
CB-1 AREA	AREA	10	.380		12.0930	4.01		
CB-1 AREA	AREA	25	.434		12.0960	4.56		
CB-1 AREA	AREA	50	.472		12.0960	4.95		
CB-1 AREA	AREA	100	.557		12.0960	5.80		
CB-1 AREA	AREA	1	.079		1.0860	2.75		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
CB-10	JCT	2	.110		12.0840	1.18		
CB-10	JCT	5	.146		12.0930	1.55		
CB-10	JCT	10	.178		12.0930	1.88		
CB-10	JCT	25	.203		12.0900	2.13		
CB-10	JCT	50	.221		12.0930	2.31		
CB-10	JCT	100	.260		12.0960	2.71		
CB-10	JCT	1	.037		1.0830	1.28		
CB-10 AREA	AREA	2	.110		12.0840	1.18		
CB-10 AREA	AREA	5	.146		12.0930	1.55		
CB-10 AREA	AREA	10	.178		12.0930	1.88		
CB-10 AREA	AREA	25	.203		12.0900	2.13		
CB-10 AREA	AREA	50	.221		12.0930	2.31		
CB-10 AREA	AREA	100	.260		12.0960	2.71		
CB-10 AREA	AREA	1	.037		1.0830	1.28		
CB-11	JCT	2	.332		12.0930	3.57		
CB-11	JCT	5	.440		12.0930	4.68		
CB-11	JCT	10	.538		12.0930	5.67		
CB-11	JCT	25	.613		12.0930	6.44		
CB-11	JCT	50	.667		12.0930	6.99		
CB-11	JCT	100	.786		12.0930	8.20		
CB-11	JCT	1	.112		1.0890	3.88		
CB-11 AREA	AREA	2	.222		12.0960	2.39		
CB-11 AREA	AREA	5	.295		12.0900	3.13		
CB-11 AREA	AREA	10	.360		12.0930	3.80		
CB-11 AREA	AREA	25	.410		12.0900	4.31		
CB-11 AREA	AREA	50	.447		12.0960	4.68		
CB-11 AREA	AREA	100	.526		12.0960	5.49		
CB-11 AREA	AREA	1	.075		1.0860	2.60		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
CB-12	JCT	2	.948		12.0960	10.20		
CB-12	JCT	5	1.256		12.0960	13.35		
CB-12	JCT	10	1.534		12.0960	16.18		
CB-12	JCT	25	1.750		12.0960	18.38		
CB-12	JCT	50	1.905		12.0960	19.95		
CB-12	JCT	100	2.244		12.0960	23.40		
CB-12	JCT	1	.320		1.0890	11.06		
CB-12 AREA	AREA	2	.616		12.0930	6.63		
CB-12 AREA	AREA	5	.816		12.0930	8.68		
CB-12 AREA	AREA	10	.997		12.0930	10.51		
CB-12 AREA	AREA	25	1.137		12.0930	11.94		
CB-12 AREA	AREA	50	1.237		12.0930	12.96		
CB-12 AREA	AREA	100	1.458		12.0930	15.20		
CB-12 AREA	AREA	1	.208		1.0890	7.20		
CB-13	JCT	2	.112		12.0930	1.21		
CB-13	JCT	5	.149		12.0960	1.58		
CB-13	JCT	10	.182		12.0930	1.92		
CB-13	JCT	25	.208		12.0930	2.18		
CB-13	JCT	50	.226		12.0960	2.37		
CB-13	JCT	100	.266		12.0900	2.77		
CB-13	JCT	1	.038		1.0860	1.31		
CB-13 AREA	AREA	2	.074		12.0840	.80		
CB-13 AREA	AREA	5	.098		12.0840	1.04		
CB-13 AREA	AREA	10	.120		12.0840	1.26		
CB-13 AREA	AREA	25	.137		12.0930	1.44		
CB-13 AREA	AREA	50	.149		12.0930	1.56		
CB-13 AREA	AREA	100	.175		12.0960	1.83		
CB-13 AREA	AREA	1	.025		1.0890	.87		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
CB-14	JCT	2	.355		12.0960	3.82		
CB-14	JCT	5	.471		12.0930	5.00		
CB-14	JCT	10	.575		12.0930	6.06		
CB-14	JCT	25	.656		12.0930	6.88		
CB-14	JCT	50	.714		12.0930	7.47		
CB-14	JCT	100	.841		12.0930	8.76		
CB-14	JCT	1	.120		1.0890	4.14		
CB-14 AREA	AREA	2	.243		12.0930	2.61		
CB-14 AREA	AREA	5	.322		12.0900	3.42		
CB-14 AREA	AREA	10	.393		12.0930	4.14		
CB-14 AREA	AREA	25	.448		12.0960	4.71		
CB-14 AREA	AREA	50	.488		12.0960	5.11		
CB-14 AREA	AREA	100	.575		12.0930	5.99		
CB-14 AREA	AREA	1	.082		1.0860	2.84		
CB-15	JCT	2	.606		12.0960	6.51		
CB-15	JCT	5	.803		12.0960	8.53		
CB-15	JCT	10	.980		12.0960	10.33		
CB-15	JCT	25	1.118		12.0960	11.74		
CB-15	JCT	50	1.217		12.0960	12.74		
CB-15	JCT	100	1.434		12.0960	14.94		
CB-15	JCT	1	.204		1.0890	7.06		
CB-15 AREA	AREA	2	.250		12.0930	2.70		
CB-15 AREA	AREA	5	.332		12.0900	3.53		
CB-15 AREA	AREA	10	.405		12.0900	4.27		
CB-15 AREA	AREA	25	.462		12.0960	4.86		
CB-15 AREA	AREA	50	.503		12.0960	5.27		
CB-15 AREA	AREA	100	.593		12.0930	6.18		
CB-15 AREA	AREA	1	.084		1.0860	2.93		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
CB-16	JCT	2	.882		12.0960	9.47		
CB-16	JCT	5	1.168		12.0960	12.40		
CB-16	JCT	10	1.427		12.0960	15.04		
CB-16	JCT	25	1.628		12.0960	17.08		
CB-16	JCT	50	1.771		12.0960	18.54		
CB-16	JCT	100	2.087		12.0960	21.74		
CB-16	JCT	1	.297		1.0890	10.25		
CB-16 AREA	AREA	2	.276		12.0900	2.97		
CB-16 AREA	AREA	5	.366		12.0930	3.89		
CB-16 AREA	AREA	10	.447		12.0960	4.71		
CB-16 AREA	AREA	25	.510		12.0960	5.35		
CB-16 AREA	AREA	50	.554		12.0930	5.81		
CB-16 AREA	AREA	100	.653		12.0930	6.81		
CB-16 AREA	AREA	1	.093		1.0860	3.22		
CB-17	JCT	2	.038		12.0690	.41		
CB-17	JCT	5	.051		12.0780	.54		
CB-17	JCT	10	.062		12.0750	.65		
CB-17	JCT	25	.071		12.0780	.74		
CB-17	JCT	50	.077		12.0900	.81		
CB-17	JCT	100	.091		12.0870	.95		
CB-17	JCT	1	.013		1.0800	.45		
CB-17 AREA	AREA	2	.038		12.0690	.41		
CB-17 AREA	AREA	5	.051		12.0780	.54		
CB-17 AREA	AREA	10	.062		12.0750	.65		
CB-17 AREA	AREA	25	.071		12.0780	.74		
CB-17 AREA	AREA	50	.077		12.0900	.81		
CB-17 AREA	AREA	100	.091		12.0870	.95		
CB-17 AREA	AREA	1	.013		1.0800	.45		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
CB-18	JCT	2	.043		12.0900	.47		
CB-18	JCT	5	.058		12.0750	.61		
CB-18	JCT	10	.070		12.0930	.74		
CB-18	JCT	25	.080		12.0840	.84		
CB-18	JCT	50	.087		12.0870	.91		
CB-18	JCT	100	.103		12.0840	1.07		
CB-18	JCT	1	.015		1.0830	.51		
CB-18 AREA	AREA	2	.043		12.0900	.47		
CB-18 AREA	AREA	5	.058		12.0750	.61		
CB-18 AREA	AREA	10	.070		12.0930	.74		
CB-18 AREA	AREA	25	.080		12.0840	.84		
CB-18 AREA	AREA	50	.087		12.0870	.91		
CB-18 AREA	AREA	100	.103		12.0840	1.07		
CB-18 AREA	AREA	1	.015		1.0830	.51		
CB-19	JCT	2	.112		12.0930	1.21		
CB-19	JCT	5	.149		12.0930	1.58		
CB-19	JCT	10	.182		12.0930	1.92		
CB-19	JCT	25	.208		12.0960	2.18		
CB-19	JCT	50	.226		12.0960	2.37		
CB-19	JCT	100	.266		12.0930	2.77		
CB-19	JCT	1	.038		1.0860	1.31		
CB-19 AREA	AREA	2	.069		12.0900	.74		
CB-19 AREA	AREA	5	.091		12.0810	.97		
CB-19 AREA	AREA	10	.112		12.0840	1.18		
CB-19 AREA	AREA	25	.127		12.0840	1.34		
CB-19 AREA	AREA	50	.139		12.0930	1.45		
CB-19 AREA	AREA	100	.163		12.0870	1.70		
CB-19 AREA	AREA	1	.023		1.0860	.81		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
CB-2	JCT	2	.483		12.0930	5.19		
CB-2	JCT	5	.640		12.0930	6.80		
CB-2	JCT	10	.782		12.0930	8.24		
CB-2	JCT	25	.892		12.0930	9.36		
CB-2	JCT	50	.970		12.0960	10.16		
CB-2	JCT	100	1.143		12.0960	11.92		
CB-2	JCT	1	.163		1.0890	5.64		
CB-2 AREA	AREA	2	.248		12.0930	2.67		
CB-2 AREA	AREA	5	.329		12.0900	3.49		
CB-2 AREA	AREA	10	.401		12.0900	4.23		
CB-2 AREA	AREA	25	.458		12.0960	4.81		
CB-2 AREA	AREA	50	.498		12.0960	5.22		
CB-2 AREA	AREA	100	.587		12.0930	6.12		
CB-2 AREA	AREA	1	.084		1.0860	2.90		
CB-20	JCT	2	.442		12.0930	4.75		
CB-20	JCT	5	.586		12.0930	6.22		
CB-20	JCT	10	.715		12.0930	7.54		
CB-20	JCT	25	.816		12.0930	8.57		
CB-20	JCT	50	.888		12.0930	9.30		
CB-20	JCT	100	1.047		12.0930	10.91		
CB-20	JCT	1	.149		1.0890	5.15		
CB-20 AREA	AREA	2	.330		12.0930	3.55		
CB-20 AREA	AREA	5	.437		12.0960	4.64		
CB-20 AREA	AREA	10	.533		12.0930	5.63		
CB-20 AREA	AREA	25	.609		12.0930	6.39		
CB-20 AREA	AREA	50	.662		12.0930	6.94		
CB-20 AREA	AREA	100	.780		12.0930	8.14		
CB-20 AREA	AREA	1	.111		1.0860	3.85		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
CB-21	JCT	2	.524		12.0960	5.63		
CB-21	JCT	5	.694		12.0960	7.37		
CB-21	JCT	10	.848		12.0960	8.94		
CB-21	JCT	25	.967		12.0960	10.15		
CB-21	JCT	50	1.052		12.0960	11.02		
CB-21	JCT	100	1.240		12.0960	12.92		
CB-21	JCT	1	.177		1.0890	6.10		
CB-21 AREA	AREA	2	.082		12.0870	.88		
CB-21 AREA	AREA	5	.108		12.0810	1.15		
CB-21 AREA	AREA	10	.132		12.0930	1.40		
CB-21 AREA	AREA	25	.151		12.0930	1.59		
CB-21 AREA	AREA	50	.164		12.0840	1.72		
CB-21 AREA	AREA	100	.194		12.0930	2.02		
CB-21 AREA	AREA	1	.028		1.0830	.95		
CB-22	JCT	2	.583		12.1020	6.26		
CB-22	JCT	5	.772		12.1020	8.20		
CB-22	JCT	10	.943	R	12.0990	9.94		
CB-22	JCT	25	1.076	R	12.0990	11.29		
CB-22	JCT	50	1.171	R	12.0990	12.25		
CB-22	JCT	100	1.379	R	12.0990	14.37		
CB-22	JCT	1	.197		1.0920	6.77		
CB-22 AREA	AREA	2	.059		12.0750	.63		
CB-22 AREA	AREA	5	.078		12.0840	.83		
CB-22 AREA	AREA	10	.095		12.0900	1.00		
CB-22 AREA	AREA	25	.109		12.0810	1.14		
CB-22 AREA	AREA	50	.118		12.0840	1.24		
CB-22 AREA	AREA	100	.139		12.0930	1.45		
CB-22 AREA	AREA	1	.020		1.0800	.68		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
CB-3	JCT	2	.733	R	12.0960	7.88		
CB-3	JCT	5	.972	R	12.0960	10.32		
CB-3	JCT	10	1.187	R	12.0960	12.51		
CB-3	JCT	25	1.354	R	12.0960	14.21		
CB-3	JCT	50	1.473	R	12.0960	15.43		
CB-3	JCT	100	1.736	R	12.0960	18.09		
CB-3	JCT	1	.247		1.0890	8.54		
CB-3 AREA	AREA	2	.250		12.0930	2.70		
CB-3 AREA	AREA	5	.332		12.0900	3.53		
CB-3 AREA	AREA	10	.405		12.0900	4.27		
CB-3 AREA	AREA	25	.462		12.0960	4.86		
CB-3 AREA	AREA	50	.503		12.0960	5.27		
CB-3 AREA	AREA	100	.593		12.0930	6.18		
CB-3 AREA	AREA	1	.084		1.0860	2.93		
CB-4	JCT	2	1.237		12.0960	13.29		
CB-4	JCT	5	1.639		12.0960	17.40		
CB-4	JCT	10	2.001		12.0960	21.09		
CB-4	JCT	25	2.283		12.0960	23.96		
CB-4	JCT	50	2.485		12.0960	26.01		
CB-4	JCT	100	2.928		12.0960	30.51		
CB-4	JCT	1	.417		1.0890	14.39		
CB-4 AREA	AREA	2	.503		12.0930	5.42		
CB-4 AREA	AREA	5	.667		12.0930	7.09		
CB-4 AREA	AREA	10	.815		12.0930	8.59		
CB-4 AREA	AREA	25	.929		12.0930	9.76		
CB-4 AREA	AREA	50	1.011		12.0930	10.60		
CB-4 AREA	AREA	100	1.192		12.0930	12.43		
CB-4 AREA	AREA	1	.170		1.0890	5.89		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
CB-5	JCT	2	1.390	R	12.0990	14.94		
CB-5	JCT	5	1.842	R	12.0990	19.56		
CB-5	JCT	10	2.249	R	12.0990	23.71		
CB-5	JCT	25	2.566	R	12.0990	26.93		
CB-5	JCT	50	2.793	R	12.0990	29.23		
CB-5	JCT	100	3.291	R	12.0990	34.29		
CB-5	JCT	1	.469		1.0920	16.16		
CB-5 AREA	AREA	2	.153		12.0960	1.65		
CB-5 AREA	AREA	5	.203		12.0900	2.16		
CB-5 AREA	AREA	10	.248		12.0960	2.62		
CB-5 AREA	AREA	25	.283		12.0930	2.97		
CB-5 AREA	AREA	50	.308		12.0900	3.23		
CB-5 AREA	AREA	100	.363		12.0900	3.78		
CB-5 AREA	AREA	1	.052		1.0860	1.79		
CB-6	JCT	2	1.559	R	12.1020	16.74		
CB-6	JCT	5	2.066	R	12.1020	21.92		
CB-6	JCT	10	2.522	R	12.1020	26.57		
CB-6	JCT	25	2.878	R	12.1020	30.19		
CB-6	JCT	50	3.131	R	12.1020	32.77		
CB-6	JCT	100	3.690	R	12.1020	38.43		
CB-6	JCT	1	.526		1.0950	18.09		
CB-6 AREA	AREA	2	.169		12.0930	1.82		
CB-6 AREA	AREA	5	.224		12.0930	2.38		
CB-6 AREA	AREA	10	.273		12.0930	2.88		
CB-6 AREA	AREA	25	.311		12.0900	3.27		
CB-6 AREA	AREA	50	.339		12.0900	3.55		
CB-6 AREA	AREA	100	.399		12.0930	4.16		
CB-6 AREA	AREA	1	.057		1.0860	1.97		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
CB-7	JCT	2	.279		12.0900	3.00		
CB-7	JCT	5	.369		12.0930	3.92		
CB-7	JCT	10	.451		12.0960	4.76		
CB-7	JCT	25	.514		12.0960	5.40		
CB-7	JCT	50	.560		12.0930	5.86		
CB-7	JCT	100	.659		12.0930	6.88		
CB-7	JCT	1	.094		1.0860	3.25		
CB-7 AREA	AREA	2	.279		12.0900	3.00		
CB-7 AREA	AREA	5	.369		12.0930	3.92		
CB-7 AREA	AREA	10	.451		12.0960	4.76		
CB-7 AREA	AREA	25	.514		12.0960	5.40		
CB-7 AREA	AREA	50	.560		12.0930	5.86		
CB-7 AREA	AREA	100	.659		12.0930	6.88		
CB-7 AREA	AREA	1	.094		1.0860	3.25		
CB-8	JCT	2	.580		12.0930	6.24		
CB-8	JCT	5	.769		12.0930	8.17		
CB-8	JCT	10	.939		12.0960	9.90		
CB-8	JCT	25	1.071		12.0960	11.25		
CB-8	JCT	50	1.165		12.0960	12.21		
CB-8	JCT	100	1.373		12.0960	14.32		
CB-8	JCT	1	.196		1.0890	6.77		
CB-8 AREA	AREA	2	.302		12.0900	3.24		
CB-8 AREA	AREA	5	.400		12.0960	4.25		
CB-8 AREA	AREA	10	.488		12.0960	5.15		
CB-8 AREA	AREA	25	.557		12.0930	5.85		
CB-8 AREA	AREA	50	.606		12.0930	6.35		
CB-8 AREA	AREA	100	.714		12.0930	7.44		
CB-8 AREA	AREA	1	.102		1.0860	3.52		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
CB-9	JCT	2	1.150		12.0960	12.37		
CB-9	JCT	5	1.524		12.0960	16.19		
CB-9	JCT	10	1.861		12.0960	19.62		
CB-9	JCT	25	2.123		12.0960	22.29		
CB-9	JCT	50	2.310		12.0960	24.19		
CB-9	JCT	100	2.722		12.0960	28.38		
CB-9	JCT	1	.388		1.0890	13.40		
CB-9 AREA	AREA	2	.570		12.0930	6.13		
CB-9 AREA	AREA	5	.755		12.0930	8.03		
CB-9 AREA	AREA	10	.922		12.0930	9.73		
CB-9 AREA	AREA	25	1.052		12.0930	11.05		
CB-9 AREA	AREA	50	1.145		12.0930	11.99		
CB-9 AREA	AREA	100	1.349		12.0930	14.07		
CB-9 AREA	AREA	1	.192		1.0890	6.66		
*OUT	JCT	2	3.338	R	13.8960	3.47		
*OUT	JCT	5	4.825	R	12.6630	9.58		
*OUT	JCT	10	6.194	R	12.5970	13.07		
*OUT	JCT	25	7.275	R	12.5910	15.10		
*OUT	JCT	50	8.055	R	12.5970	16.36		
*OUT	JCT	100	9.799	R	12.5040	27.59		
*OUT	JCT	1	.825	R	1.8570	1.80		
SED POND IN	POND	2	5.120	R	12.1050	54.96		
SED POND IN	POND	5	6.786		12.1020	71.97		
SED POND IN	POND	10	8.286		12.1020	87.25		
SED POND IN	POND	25	9.453	R	12.1020	99.12		
SED POND IN	POND	50	10.287		12.1020	107.59		
SED POND IN	POND	100	12.123		12.1020	126.21		
SED POND IN	POND	1	1.727		1.0980	59.28		

MASTER NETWORK SUMMARY
SCS Unit Hydrograph Method

(*Node=Outfall; +Node=Diversion;)
(Trun= HYG Truncation: Blank=None; L=Left; R=Rt; LR=Left&Rt)

Node ID	Type	Return Event	HYG Vol ac-ft	Trun	Qpeak hrs	Qpeak cfs	Max WSEL ft	Max Pond Storage ac-ft
SED POND	OUT POND	2	3.338	LR	13.8960	3.47	65.13	3.899
SED POND	OUT POND	5	4.825	LR	12.6630	9.58	65.81	4.545
SED POND	OUT POND	10	6.194	LR	12.5970	13.07	66.59	5.328
SED POND	OUT POND	25	7.274	LR	12.5910	15.10	67.21	5.971
SED POND	OUT POND	50	8.055	LR	12.5970	16.36	67.64	6.437
SED POND	OUT POND	100	9.799	LR	12.5040	27.59	68.39	7.285
SED POND	OUT POND	1	.825	LR	1.8570	1.80	63.90	2.816

***** COMPOSITE OUTFLOW SUMMARY ****

WS Elev, Total Q		Notes		
		Converge		
Elev. ft	Q cfs	TW Elev ft	Error +/-ft	Contributing Structures
60.00	.00	Free Outfall		None contributing
60.50	.47	Free Outfall		O0
61.00	.82	Free Outfall		O0
61.50	1.06	Free Outfall		O0
62.00	1.25	Free Outfall		O0
62.50	1.42	Free Outfall		O0
63.00	1.57	Free Outfall		O0
63.50	1.70	Free Outfall		O0
64.00	1.83	Free Outfall		O0
64.50	1.95	Free Outfall		O0
65.00	2.06	Free Outfall		R0 +O0
65.50	7.71	Free Outfall		R0 +O0
66.00	10.77	Free Outfall		R0 +O0
66.50	12.78	Free Outfall		R0 +O0
67.00	14.48	Free Outfall		R0 +O0
67.50	15.99	Free Outfall		R0 +O0
68.00	17.36	Free Outfall		R0 +O0 +W0
68.50	30.40	Free Outfall		R0 +O0 +W0
69.00	53.11	Free Outfall		R0 +O0 +W0

Attachment B
Pre-development Calculations

Cornell-Dublier
Pre-Development-Rational Method

Subject: Use Rational Method to Estimate Flow of Surface Water for Pre-Development Conditions

- Assuming total acres that contribute to pre-development run-off = 18 acres
- Assuming all acreage is grass

TR-55 Sheet Flow

$$T = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} S_f^{0.4}}$$

n =	0.2	(good stand of grass)		
L =	160	ft		
P_2 =	3.3	in		
S_f =	0.02			
T =	**0.29**	hr	or	**17.7** min

n	=	Manning's roughness coefficient from TR-55 table
L	=	Flow length (ft)
P_2	=	Two-year, 24-hour rainfall (in)
S_f	=	Slope (ft/ft)

TR-55 Shallow Concentrated Flow

Unpaved Surfaces

$$V = 16.1345 S_f^{0.5}$$

S_f =	0.013	
V =	**1.83962**	fps

V	=	Average velocity (ft/sec.)
S_f	=	Slope of hydraulic grade line (ft/ft)

$$T_c = \left(\frac{L_f}{V}\right)\left(\frac{1\,\text{hr.}}{3600\,\text{sec.}}\right)$$

L_f =	720	ft		
T_c =	**0.11**	hr	or	**6.5** min

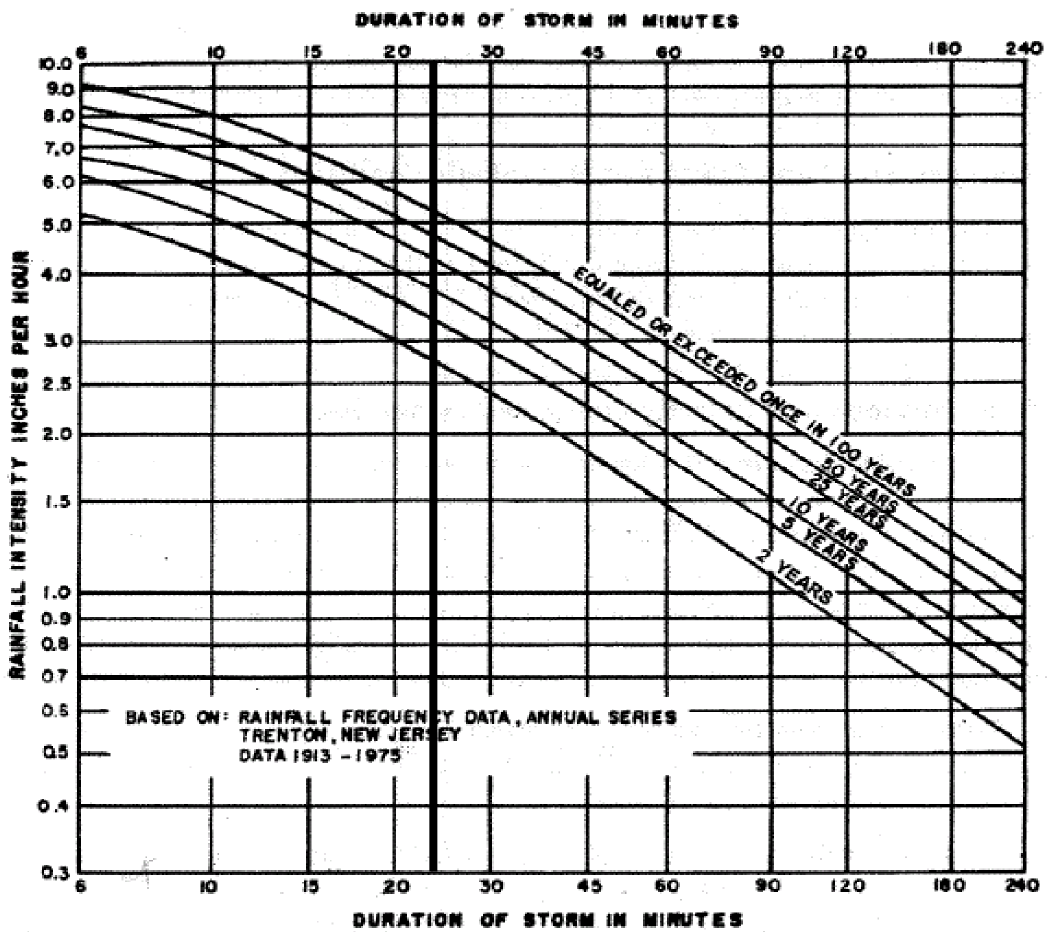
T_c	=	Time of concentration (hr.)
L_f	=	Flow length (ft)
V	=	Average velocity (ft/sec.)

Total Tc = **24.2** min

*Equations taken from PondPack User's Guide

Cornell-Dublier
Pre-Development-Rational Method

New Jersey Stormwater Best Management Practices Manual • Chapter 5: Computing Stormwater Runoff Rates and Volumes • February 2004 • Page 5-11



$$Q = CiA$$

Q = Discharge in cubic feet per second

C = Coefficient of runoff

I = Average rainfall intensity in inches per hour, for a given storm frequency and for a duration equal to the time of concentration.

A = Drainage area in acres

Types of Surface	Coefficient of Runoff "C"
Pavement & paved shoulders	0.9
Berms and slopes 4:1 or flatter	0.5
Berms and slopes steeper than 4:1	0.7
Contributing areas	
Residential (single family)	0.3-0.5
Residential (multi-family)	0.4-0.7
Woods	0.3
Cultivated	0.3-0.6

$I_{(2)}$ =	2.8	in/hr
$I_{(5)}$ =	3.3	in/hr
$I_{(10)}$ =	3.8	in/hr
$I_{(25)}$ =	4.25	in/hr
$I_{(50)}$ =	4.7	in/hr
$I_{(100)}$ =	5.25	in/hr

C= 0.4

A= 18

$Q_{(2)}$ =	20.2 cfs	50%	**10.1**
$Q_{(5)}$ =	23.8 cfs		
$Q_{(10)}$ =	27.4 cfs	75%	**20.5**
$Q_{(25)}$ =	30.6 cfs		
$Q_{(50)}$ =	33.8 cfs		
$Q_{(100)}$ =	37.8 cfs	80%	**30.2**

Attachment C
Catch Basin Calculations

Cornell Dublier
Catch Basin Network

Catch Basin Number	Rim (Elev.)	Pipe Invert In (Elev.)	Pipe Invert Out (Elev.)	Pipe Diameter D (ft)	Rim to Top of Pipe In (Depth.)	Rim to Top of Pipe Out (Depth.)	Pipe Run	Approx. Length (ft)	Slope (ft/ft)	Upslope Invert (Elev.)	Downslope Invert (Elev.)
1	76.00	70.50	70.50	1.50		4.00	1-2	160.00	0.0031	70.5000	70.0000
2	74.00	70.00	68.00	2.00	2.50	4.00	2-3	160.00	0.0031	68.0000	67.5000
3	72.00	67.50	65.80	2.00	2.50	4.20	3-4	160.00	0.0031	65.8000	65.3000
4	69.80	65.30	64.80	2.50	2.50	2.50	4-5	100.00	0.0040	64.8000	64.4000
5	69.80	64.40	64.40	2.50	2.90	2.90	5-6	180.00	0.0033	64.4000	63.8000
6	69.80	63.80	63.80	2.50	3.50	3.50	6-POND	250.00	0.0032	63.8000	63.0000
7	76.00	70.00	70.00	1.50		4.50	7-8	200.00	0.0035	70.0000	69.3000
8	73.60	69.30	69.30	2.00	2.80	2.30	8-POND	90.00	0.0367	69.3000	66.0000
9	71.50	66.00	66.50	2.00	3.50	3.00	9-POND	50.00	0.0040	66.5000	66.3000
10	76.00	70.50	70.50	1.00		4.50	10-11	200.00	0.0030	70.5000	69.9000
11	73.50	69.90	68.00	1.50	2.60	4.00	11-12	160.00	0.0044	68.0000	67.3000
12	71.50	67.30	66.60	2.50	2.70	2.40	12-POND	100.00	0.0040	66.6000	66.2000
13	74.00	68.90	68.90	1.00	2.60	4.10	13-14	140.00	0.0036	68.9000	68.4000
14	72.00	68.40	67.20	1.50	2.60	3.30	14-15	140.00	0.0036	67.2000	66.7000
15	71.00	66.70	65.50	2.00	2.80	3.50	15-16	160.00	0.0031	65.5000	65.0000
16	70.00	65.00	65.00	2.00	3.00	3.00	16-POND	110.00	0.0036	65.0000	64.6000
17	73.00	69.50	69.50	1.00		2.50	17-13	140.00	0.0043	69.5000	68.9000
18	74.50	68.90	67.50	1.00	4.60	6.00	18-19	160.00	0.0031	67.5000	67.0000
19	70.50	67.00	63.90	1.00	2.50	5.60	19-20	140.00	0.0036	63.9000	63.4000
20	67.50	63.40	63.40	1.50	3.10	2.60	20-21	120.00	0.0033	63.4000	63.0000
21	68.90	63.00	63.00	2.00	4.40	3.90	21-22	100.00	0.0030	63.0000	62.7000
22	69.80	62.70	62.70	2.00	5.10	5.10	22-23	200.00	0.0030	62.7000	62.1000
23	71.00	62.10	62.10	2.00	6.90	6.90	23-24	200.00	0.0030	62.1000	61.5000
24	71.00	61.50	61.50	2.00	7.50	7.50	24-25	140.00	0.0036	61.5000	61.0000
25	70.00	61.00	61.00	2.00	7.00	7.00	25-POND	260.00	0.0038	61.0000	60.0000

* Assuming 1 foot of pipe cover and 1.25 feet of pavement/sub-base, need at least 2.25 ft depth from rim to top of pipe.

Attachment D
Piping Calculations

Pipe Calculations

Cornell-Dublier
South Plainfield, NJ

	User-Defined Pipe Geometry									Calculated Flow Relationships						
Pipe Run	Length (ft)	Slope (ft/ft)	Upslope Invert (Elev.)	Downslope Invert (Elev.)	25 YEAR Observed/ Design Flow (cfs)	Diameter D (ft)	Flow Depth d (ft)	Depth-to-Pipe-Diameter Ratio d/D	Depth to Pipe Diameter Ratio d/D	Flow Area A (ft^2)	Wetted Perimeter P (ft)	Hydraulic Radius R_h (ft)	Flow Velocity v (ft/s)	Travel Time T_t (min)	Calculated Flow Rate Q_{calc} (cfs)	Observed/ Design Flow Rate Q_{des} (cfs)
1-2	160	0.0031	70.5	70.0	4.6	1.50	1.13	0.750	0.75	1.422	3.142	0.453	5.45	0.49	7.753	4.56
2-3	160	0.0031	68.0	67.5	9.4	2.00	1.50	0.750	0.75	2.527	4.189	0.603	6.61	0.40	16.698	9.36
3-4	160	0.0031	65.8	65.3	14.2	2.00	1.50	0.750	0.75	2.527	4.189	0.603	6.61	0.40	16.698	14.21
4-5	100	0.0040	64.8	64.4	24.0	2.50	1.88	0.750	0.75	3.949	5.236	0.754	8.68	0.19	34.256	23.97
5-6	180	0.0033	64.4	63.8	26.9	2.50	1.88	0.750	0.75	3.949	5.236	0.754	7.92	0.38	31.271	26.94
6-Pond	240	0.0033	63.8	63.0	30.2	2.50	1.88	0.750	0.75	3.949	5.236	0.754	7.92	0.51	31.271	30.19
7-8	200	0.0035	70.0	69.3	5.4	1.50	1.13	0.750	0.75	1.422	3.142	0.453	5.77	0.58	8.205	5.40
8-Pond	100	0.0330	69.3	66.0	11.3	2.00	1.50	0.750	0.75	2.527	4.189	0.603	21.47	0.08	54.263	11.25
9-Pond	60	0.0033	66.5	66.3	11.1	2.00	1.50	0.750	0.75	2.527	4.189	0.603	6.82	0.15	17.246	11.10
10-11	200	0.0030	70.5	69.9	2.1	1.00	0.75	0.750	0.75	0.632	2.094	0.302	4.08	0.82	2.576	2.13
11-12	160	0.0044	68.0	67.3	6.4	1.50	1.13	0.750	0.75	1.422	3.142	0.453	6.45	0.41	9.173	6.44
12-Pond	100	0.0040	66.6	66.2	18.4	2.50	1.88	0.750	0.75	3.949	5.236	0.754	8.68	0.19	34.256	18.38
13-14	140	0.0036	68.9	68.4	2.2	1.00	0.75	0.750	0.75	0.632	2.094	0.302	4.45	0.52	2.811	2.18
14-15	140	0.0036	67.2	66.7	6.9	1.50	1.13	0.750	0.75	1.422	3.142	0.453	5.83	0.40	8.288	6.88
15-16	160	0.0031	65.5	65.0	11.7	2.00	1.50	0.750	0.75	2.527	4.189	0.603	6.61	0.40	16.698	11.74
16-Pond	100	0.0040	65.0	64.6	17.1	2.00	1.50	0.750	0.75	2.527	4.189	0.603	7.48	0.22	18.892	17.08
17-13	140	0.0043	69.5	68.9	0.7	1.00	0.75	0.750	0.75	0.632	2.094	0.302	4.87	0.48	3.079	0.74
18-19	160	0.0031	67.5	67.0	0.8	1.00	0.75	0.750	0.75	0.632	2.094	0.302	4.16	0.64	2.629	0.84
19-20	140	0.0036	63.9	63.4	2.2	1.00	0.75	0.750	0.75	0.632	2.094	0.302	4.45	0.52	2.811	2.18
20-21	120	0.0033	63.4	63.0	8.6	1.50	1.13	0.750	0.75	1.422	3.142	0.453	5.63	0.36	8.007	8.57
21-22	100	0.0030	63.0	62.7	10.2	2.00	1.50	0.750	0.75	2.527	4.189	0.603	6.47	0.26	16.361	10.15
22-23-24-25-Pond	820	0.0033	62.7	60.0	11.3	2.00	1.50	0.750	0.75	2.527	4.189	0.603	6.78	2.02	17.140	11.29

User-Defined Input Data:

Pipe Material:	10	HDPE,
Manning's Roughness Coefficient, n:		0.009
Observed/Design Flow, gpm:	-	
gallons/day:	-	
gallons/month:	-	

Gravity Flow in Circular Pipes

The Sheet *Flow Calcs* is a spreadsheet tabulation designed to allow the user to calculate either the flow rate through an existing circular pipe, the flow depth through a circular pipe, or the required minimum diameter of a proposed pipe.

Basic User-Defined Input:

The user must define the Manning's Coefficient and the Observed or Design Flow Rate in Cells D24 and D25 (beneath the table).

Manning's Coefficient, n: This may be directly input by the user (Cell D24) or the user may enter the number of a pipe/surface material from the chart on Sheet "Manning n" in (Cell C23) and Excel will look up the value to enter in (Cell D24).

Flow Rate: The user may enter the flow rate, in gallons/minute, in (Cell D25). Excel will calculate the flow in gallons/day and gallons/month in the cells

The user may also enter the pipe segment, length, and slope in Columns A through E of the table.

If the Spreadsheet is used to calculate Q or flow depth, d, of an existing pipe:

Enter the ***pipe diameter, D,*** in Column F.

The ***Flow Depth, d,*** (Column G) may be determined in one of two ways:

1. The user may enter this in an iterative fashion until the calculated Flow Rate, Q_{calc}, approximately equals the design Flow Rate, Q_{des}.

2. The user may use the "Goal Seek…" feature under Excels "Tools" pull-down menu as follows:
   "Set Cell" - select the cell under Q_{calc} for which the optimazation is to be conducted
   "To Value" - insert the numerical value of Q_{calc} (equal to Q_{des})
   "By Changing Cell" - select the cell under Flow Depth which will be changed to yield the desired Q_{calc}

   Note: *the Goal Seek tool may not converge to an answer*.

Excel will calculate the ***Flow-Depth-to-Pipe-Diameter Ratio, d/D,*** in Column H.

Using d/D, Excel will look up the geometric relationships on Sheet *Circular* and calculate the the ***Flow Area, A***, the ***Wetted Perimeter, P_w***, and the ***Hydraulic Radius, R_h***, in Columns I - K.

Excel calculates the ***Flow Velocity, v,*** in Column L using Manning's Equation:

$v = (1.49/n)*(R_h)^{2/3}*S^{1/2}$

n = Manning's Coefficient [user-defined in Cell D24 (direct input) or by selecting pipe material in Cell C23 (see Sheet "Manning n")]

R_h = Hydraulic Radius

S = Slope (in ft/ft)

Excel calculates the ***Travel Time, T_t***, in Column M using the equation:

$T_t = L/v$

Excel calculates the ***Flow Rate, Q_{calc}***, as follows:

$Q_{calc} = v*A$

v = Flow Velocity, as calculated by Manning's Equation

A = Flow Area, as calcuated in Column I

Excel calculates the ***design Flow Rate***, ***Q_{des}***, in cubic feet per second (cfs) based on a unit conversion of the user-defined flow rate entered in Cell D25.

<u>If the Spreadsheet is used to determine the design diameter of a pipe based on a design flow rate:</u>

In the final two columns, Excel calculates the minimum design diameter for full-flow conditions based on rearrangement of the Chezy-Manning Equation, as recommended by the American Pipe Manual (American Cast Iron Pipe Company, 1986):

$$Q = (1.49/n)\ A\ R^{2/3}\ S^{1/2}$$

$$A\ R^{2/3} = (Qn/S^{1/2})(1/1.49)$$

$$(c_1D^2)(c_2D)^{2/3} = (Qn/S^{1/2})(0.671)$$

Where c_1, c_2 are the values of A/D^2 and R_h/D for a given d/D (see Sheet *Circular*)

$$D = [(Qn/S^{1/2})\{0.671/(c_1)(c_2)^{2/3}\}]^{3/8}$$

Note: for gravity flow, the"full-flow" capacity is generally assumed to correspond to a d/D ratio of approximately 0.67 and the equation reduces to:

$$D = [(2.76Qn)/S^{1/2}]^{3/8}$$

Flow Through Circular Pipes
Geometric Relationships

(Area, Wetted Perimeter, and Hydraulic Radius)

d/D	A/D^2	P_w/D	R_h/D
0.01	0.0013	0.2003	0.0066
0.02	0.0037	0.2838	0.0132
0.03	0.0069	0.3482	0.0197
0.04	0.0105	0.4027	0.0262
0.05	0.0147	0.4510	0.0326
0.06	0.0192	0.4949	0.0389
0.07	0.0242	0.5355	0.0451
0.08	0.0294	0.5735	0.0513
0.09	0.0350	0.6094	0.0574
0.10	0.0409	0.6435	0.0635
0.11	0.0470	0.6761	0.0695
0.12	0.0534	0.7075	0.0754
0.13	0.0600	0.7377	0.0813
0.14	0.0688	0.7670	0.0871
0.15	0.0739	0.7954	0.0929
0.16	0.0811	0.8230	0.0986
0.17	0.0885	0.8500	0.1042
0.18	0.0961	0.8763	0.1097
0.19	0.1039	0.9020	0.1152
0.20	0.1118	0.9273	0.1206
0.21	0.1199	0.9521	0.1259
0.22	0.1281	0.9764	0.1312
0.23	0.1365	1.0003	0.1364
0.24	0.1449	1.0239	0.1416
0.25	0.1535	1.0472	0.1466

Flow Through Circular Pipes
Geometric Relationships

(Area, Wetted Perimeter, and Hydraulic Radius)

d/D	A/D^2	P_w/D	R_h/D
0.26	0.1623	1.0701	0.1516
0.27	0.1711	1.0928	0.1566
0.28	0.1800	1.1152	0.1614
0.29	0.1890	1.1373	0.1662
0.30	0.1982	1.1593	0.1709
0.31	0.2074	1.1810	0.1755
0.32	0.2167	1.2025	0.1801
0.33	0.2260	1.2239	0.1848
0.34	0.2355	1.2451	0.1891
0.35	0.2450	1.2661	0.1935
0.36	0.2546	1.2870	0.1978
0.37	0.2642	1.3078	0.2020
0.38	0.2739	1.3284	0.2061
0.39	0.2836	1.3490	0.2102
0.40	0.2934	1.3694	0.2142
0.41	0.3032	1.3898	0.2181
0.42	0.3130	1.4101	0.2220
0.43	0.3229	1.4303	0.2257
0.44	0.3328	1.4505	0.2294
0.45	0.3428	1.4706	0.2331
0.46	0.3527	1.4907	0.2366
0.47	0.3627	1.5108	0.2400
0.48	0.3727	1.5308	0.2434
0.49	0.3827	1.5508	0.2467
0.50	0.3927	1.5708	0.2500

Flow Through Circular Pipes
Geometric Relationships

(Area, Wetted Perimeter, and Hydraulic Radius)

d/D	A/D^2	P_w/D	R_h/D
0.51	0.4027	1.5908	0.2531
0.52	0.4127	1.6108	0.2561
0.53	0.4227	1.6308	0.2591
0.54	0.4327	1.6509	0.2620
0.55	0.4426	1.6710	0.2649
0.56	0.4526	1.6911	0.2676
0.57	0.4625	1.7113	0.2703
0.58	0.4723	1.7315	0.2728
0.59	0.4822	1.7518	0.2753
0.60	0.4920	1.7722	0.2776
0.61	0.5018	1.7926	0.2797
0.62	0.5115	1.8132	0.2818
0.63	0.5212	1.8338	0.2839
0.64	0.5308	1.8546	0.2860
0.65	0.5404	1.8755	0.2881
0.66	0.5499	1.8965	0.2899
0.67	0.5594	1.9177	0.2917
0.68	0.5687	1.9391	0.2935
0.69	0.5780	1.9606	0.2950
0.70	0.5872	1.9823	0.2962
0.71	0.5964	2.0042	0.2973
0.72	0.6054	2.0264	0.2984
0.73	0.6143	2.0488	0.2995
0.74	0.6231	2.0714	0.3006
0.75	0.6318	2.0944	0.3017

Flow Through Circular Pipes
Geometric Relationships

(Area, Wetted Perimeter, and Hydraulic Radius)

d/D	A/D^2	P_w/D	R_h/D
0.76	0.6404	2.1176	0.3025
0.77	0.6489	2.1412	0.3032
0.78	0.6573	2.1652	0.3037
0.79	0.6655	2.1895	0.3040
0.80	0.6736	2.2143	0.3042
0.81	0.6815	2.2395	0.3044
0.82	0.6893	2.2653	0.3043
0.83	0.6969	2.2916	0.3041
0.84	0.7043	2.3186	0.3038
0.85	0.7115	2.3462	0.3033
0.86	0.7186	2.3746	0.3026
0.87	0.7254	2.4038	0.3017
0.88	0.7320	2.4341	0.3008
0.89	0.7384	2.4655	0.2995
0.90	0.7445	2.4981	0.2980
0.91	0.7504	2.5322	0.2963
0.92	0.7560	2.5681	0.2944
0.93	0.7612	2.6061	0.2922
0.94	0.7662	2.6467	0.2896
0.95	0.7707	2.6906	0.2864
0.96	0.7749	2.7389	0.2830
0.97	0.7785	2.7934	0.2787
0.98	0.7816	2.8578	0.2735
0.99	0.7841	2.9412	0.2665
1.00	0.7854	3.1416	0.2500

Notes:

from the Engineer-in-Training Reference Manual,
Professional Publications Inc., Belmont, CA

Manning's Coefficients

	Pipe/Channel Material	*Manning n*
1	Planed Wood	0.012
2	Unplaned Wood	0.013
3	Finished Concrete	0.012
4	Unfinished Concrete	0.014
5	Concrete Pipe	0.015
6	Sewer Pipe	0.013
7	Vitrified Clay	0.013
8	Brick	0.016
9	Plastic Pipe (SDR, S&D, etc.)	0.011
#	HDPE, smooth	0.009
#	HDPE, corrugated (3-6" d)	0.015
#	HDPE, corrugated (18-24" d)	0.020
#	Ductile Iron w/ poly liner	0.010
#	Cast/Wrought Iron	0.015
#	Riveted Steel	0.017
#	Corrugated Metal Flumes	0.025
#	Earth, straight channel	0.022
#	Rubble	0.030
#	Earth, w/ stones, weeds	0.035
#	Mountain Streams	0.050

Notes:
Manning's Coefficients are dependent on flow velocity, and cited values are typically based on velocities ranging from approximately 2.0 ft/sec to 5.0 ft/sec. For lower flow velocities, the appropriate Manning's Coefficient may be greater than values listed in this table.

Attachment E
Conduit Outlet Protection Calculations

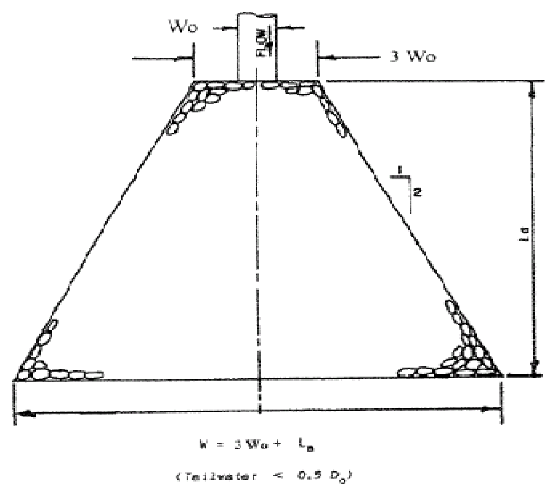
Rip Rap Apron Conduit Outlet Protection

Cornell-Dublier

Pipe Inlet	Q (cfs)	q (unit discharge)	D_o (ft)	W_o (ft)	L_a	Top Width (ft)	Bottom Width (ft)
1 (CB-8)	11.3	4.52	2.5	2.5	22.65	7.5	30.15
2 (CB-9)	11.1	4.44	2.5	2.5	22.55	7.5	30.05
3 (CB-6)	30.2	15.10	2	2	33.22	6	39.22
4 (CB-25)	11.3	4.52	2.5	2.5	22.65	7.5	30.15
5 (CB-16)	17.1	8.55	2	2	24.88	6	30.88
6 (CB-12)	11.3	5.65	2	2	21.19	6	27.19
Pond Outlet	15.1	10.07	1.5	1.5	25.29	4.5	29.79

$$L_a = \left(1.8\frac{q}{D_o^{1/2}}\right) + 7D_o \qquad TW < \tfrac{1}{2} D_o$$

$$W = 3\ W_o + L_a$$



* Equations and Diagram Taken from:

Standards for Soil Erosion and Sediment Control in New Jersey

Conduit Outlet Protection 12-5 *July 1999*

"RipRap Size"

The median stone diameter, D_{50}, in feet, shall be determined from the formula:

$$D_{50} = \frac{0.016}{T_w} q^{1.33}$$

TW = 0.5
D_{50} = 0.24 feet
2.86 inches

*Assming Tailwater is .2 Do and using largest Diameter Pipe

APPENDIX D

Appendix D

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

INSPECTION BEING CONDUCTED:

QUARTERLY ___ **ANNUALLY ___** **AFTER 1" or GREATER RAINFALL ___**

AFTER 1.25" IN 2 HOUR STORM EVENT ___ **UNDER SPECIAL CIRCUMSTANCES ___**

Inspection Date: ____________________ Weather: ____________________________________

Inspector's Name: ____

"BASIN" Inspection:

	Yes	No	N/A
Catch Basins (23 Structures):			
1. Are catch basins properly draining?	☐	☐	☐
2. Are the catch basins clear of trash, sediment, and debris?	☐	☐	☐
3. Has vegetation been removed from all catch basin areas?	☐	☐	☐
4. Are there any signs of damage or deterioration of catch basins? If yes, which catch basin(s)? _______________ (Refer to Record Drawings for catch basin numbers)	☐	☐	☐
Stormwater Detention Basin and Surface Sand Filter:			
5. Does the basin have pooled or standing water? If yes, describe where: ____	☐	☐	☐
6. What is the water height? ______________________________________ Approximately how many hours ago was the last rainfall? ________ How many inches of rain? ________			
7. Does the bottom appear relatively flat? No sand has washed away?	☐	☐	☐
8. Are concentrated flows of runoff being unexpectedly directed into the basin? If yes, describe where: ____	☐	☐	☐
9. Is there any damage to the sand bed or berms?	☐	☐	☐
10. Has vegetation been removed from the basin areas?	☐	☐	☐

Appendix D

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

	Yes	No	N/A
Inlet and Outlet Structures:			
11. Are the five inlet and four outlet structures draining properly?	☐	☐	☐
12. Is there any standing water? If yes, describe where: ______________________________	☐	☐	☐
13. Are the inlets clear of trash, sediment, and debris?	☐	☐	☐
14. Are the outlets (standpipe, 3” orifice, secondary outlet, and emergency spillway) clear of trash, sediment, and debris?	☐	☐	☐
15. Are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where: ______________________________	☐	☐	☐
16. Has vegetation been removed from the inlets and outlets?	☐	☐	☐

Additional descriptions of where repairs or maintenance is needed:

____

____

____

____

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____

____

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____

____

____

____

____

Inspector’s Signature

APPENDIX D

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

"Pavement" Inpsection (Part of Annual Inspection):

	Yes	No	N/A
1. Is there any standing water? If yes, describe where: ______________________________________	☐	☐	☐
2. Are there any signs of cracking? If so, note location and maintenance effort below.	☐	☐	☐
3. Are there any signs of disintegration? If so, note location and maintenance effort below.	☐	☐	☐
4. Are there any signs of distortion? If so, note location and maintenance effort below.	☐	☐	☐
5. Has all vegetation been removed? If applicable, note location of vegetation below.	☐	☐	☐
6. Has the usage of the Site increased to a point that warrants a Pavement Condition Index (PCI) survey?	☐	☐	☐
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied? When was the date of the last CPM treatment? __________ (Refer to Section 2.2.3 of the Operation & Maintenance Manual)	☐	☐	☐

Additional descriptions of where repairs or maintenance is needed:

____

____

____

____

____

____

____

____
Inspector's Signature

APPENDIX D

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Basin Drainage Rate Inspection:
(completed twice a year after design rainfall event)

Date: ___________

Design Rainfall Event Information
Requirements: 1.25" of rain in 2 hours

Start: ___________
Stop: ___________
Inches of Rainfall: ___________

Inspection Data:
Start inspections 16 hours after design rain event
Perform subsequent inspections every 2 hours until the height of water drops below the top of the aggregate in the middle basin.

Inspection Run #	Target Time From Event (hrs)	Actual Time	Water height (ft)
1	16		
2	18		
3	20		
4	22		
5	24		
6	26		
7	28		
8	30		
9	32		
10	34		

Note approximate time water was drained below top of sand bed and compare to the normal drain time of 21 hours:

____

____

____
Inspector's Signature

APPENDIX E

Appendix E
Point of Contact Information
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Mr. Diego Garcia

USEPA Region 2

290 Broadway

New York City, NY 10007-1866

garcia.diego@epamail.epa.gov

Office Phone: 212-637-4947

APPENDIX F

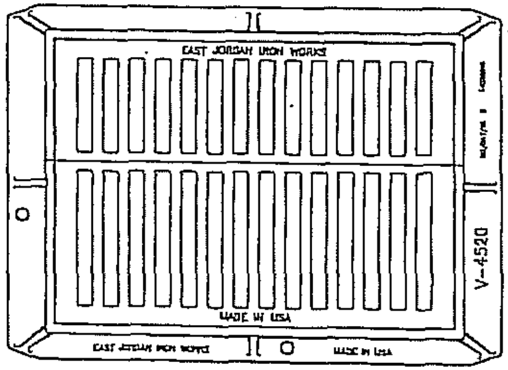
Below are Malcolm Pirnie's comments on the attached Drainage Structure Cut Sheets, which was submitted via email on April 13, 2011:

1. *Please provide a proposed material list which corresponds to the Catch Basin Schedule shown on Drawing G-12. It is not clear what type or size structure is proposed for a specific location on-site. Also indicate the number and size of any riser sections that will be required at each location.*
2. *Currently a mortared joint is shown for the 48" diameter stormwater manhole and a grouted joint is shown for the 60" diameter stormwater manhole. Please confirm that the Press Seal gaskets will be utilized for manhole-to-pipe seals.*
3. *It appears only the "type 2" style grate was included in the submittal. Please provide information for "Type 1" and "Type 3" styles as shown on Drawings G-12 and G-14.*

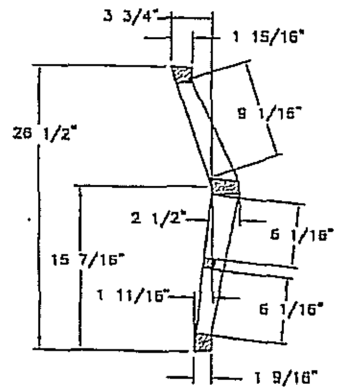
Please let me know if you have any questions

Thanks
Ben

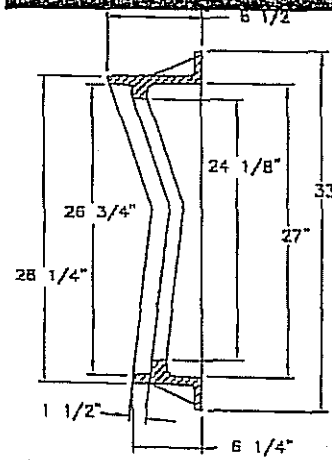
V4520 V4520-1 ASSEMBLY



PLAN VIEW



GRATE SECTION



FRAME SECTION

PRODUCT NUMBER

44520001

DESIGN FEATURES

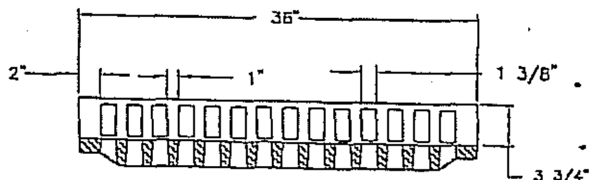
MATERIALS
GRATE-GRAY IRON
ASTM A48 CL35B
FRAME-GRAY IRON
ASTM A48 CL35B

DESIGN LOAD
HEAVY DUTY

COATING
UNDIPPED

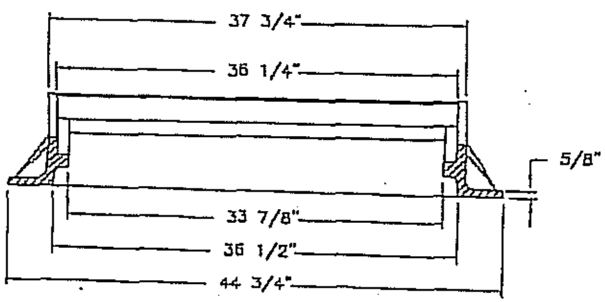
OPEN AREA
458 SQ. INCHES

√ DESIGNATES MACHINE SURFACE



GRATE SECTION

CB-1, 2, 3, 4A, 7, 8, 10, 11, 13, 13A, 14, 15, 17, ~~18~~, 19, 20, 21, 22
(TYPE 2)



FRAME SECTION

REFERENCE INFORMATION

44520130
44520010

DRAWING DETAILS

ORIGINAL DRAWING: DEW 11/11/03
REVISED BY: DEW 10/29/10

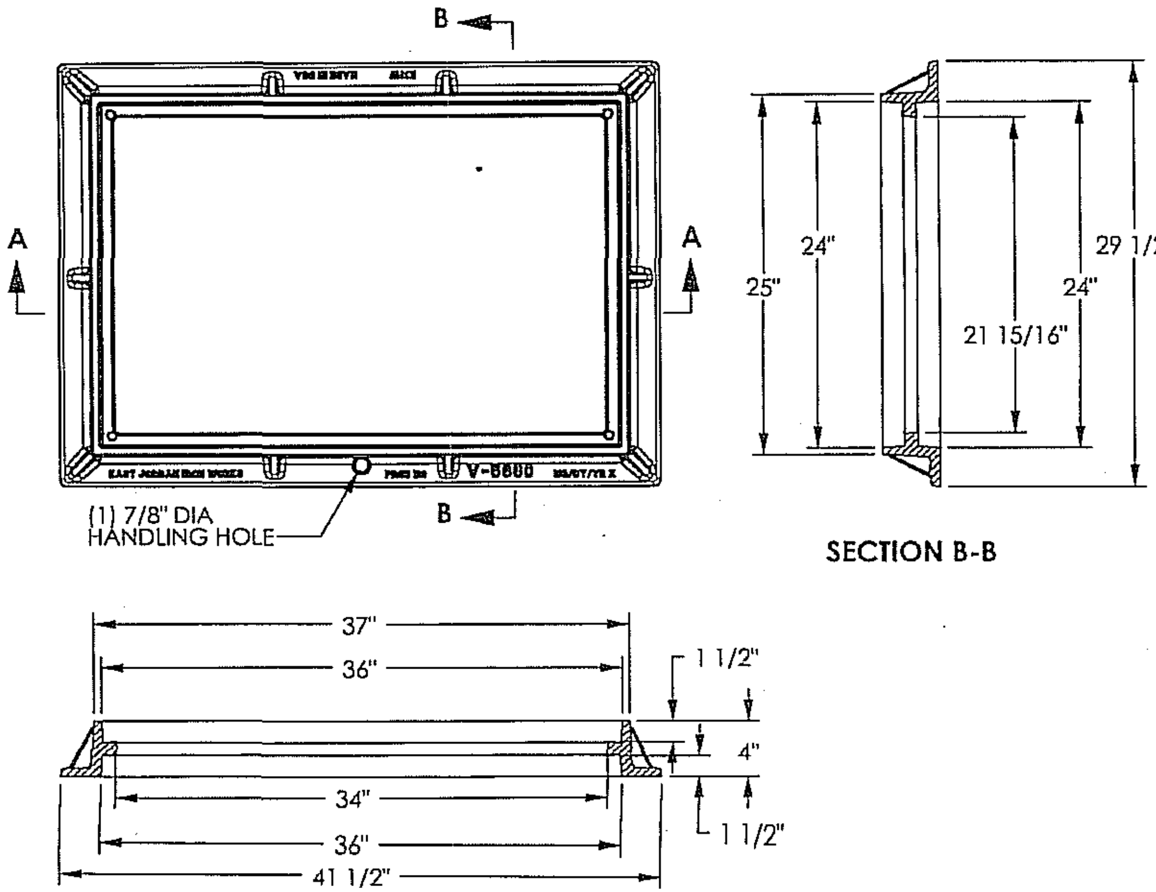
Corporate Headquarters
301 Spring Street
PO Box 439
East Jordan, MI
49727-0439
800.874.4100

•Weights (lbs./kg.) dimensions (inches/mm.) and drawings provided for your guidance.
•We reserve the right to modify specifications without prior notice.
•Uncontrolled distribution.

V-5660 FRAME

CB - 4, 5, 6, 9, 12, 16

(TYPE 1) FRAME



SECTION B-B

SECTION A-A

PRODUCT NUMBER

45660010

DESIGN FEATURES

MATERIALS
FRAME-GRAY IRON
ASTM A48 CL35B

DESIGN LOAD
HEAVY DUTY

COATING
UNDIPPED

OPEN AREA
N/A

✓ DESIGNATES MACHINE SURFACE

NOTE: FRAME IS REVERSIBLE AND CAN BE INSTALLED AS A TOP FLANGE UNIT.

Corporate Headquarters
301 Spring Street
PO Box 439
East Jordan, MI
49727-0439
800.874.4100
EJ GROUP

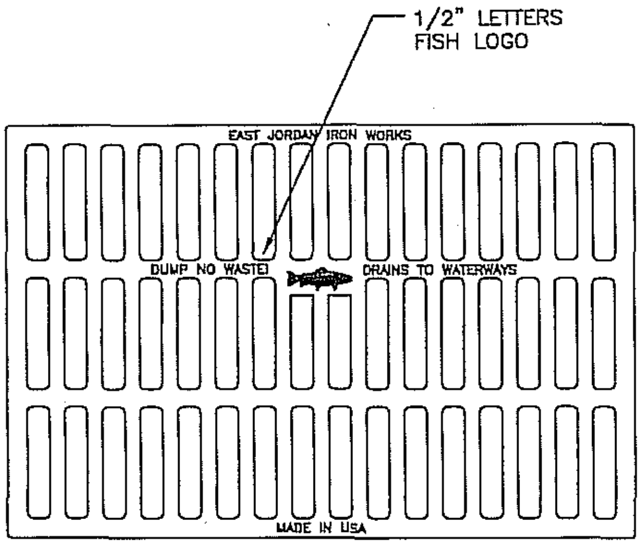
• Weights (lbs./kg.) dimensions (inches/mm., and drawings provided for your guidance.
• We reserve the right to modify specifications without prior notice.
• Uncontrolled distribution.

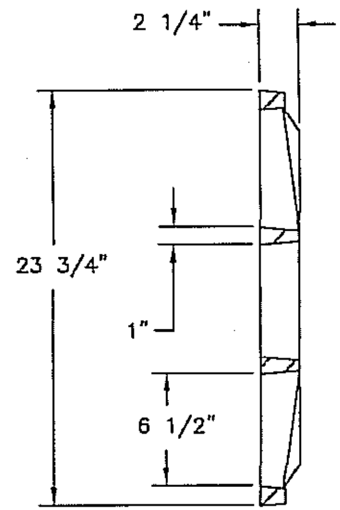
DRAWING DETAILS

ORIGINAL DRAWING:	SBB	4/16/2002
REVISED BY:	DEW	2/8/2011

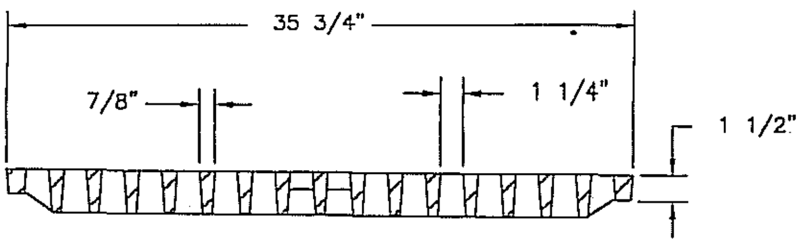
CB - 4, 5, 6, 9, 12, 16 .

(TYPE 4) GRATE





GRATE SECTION



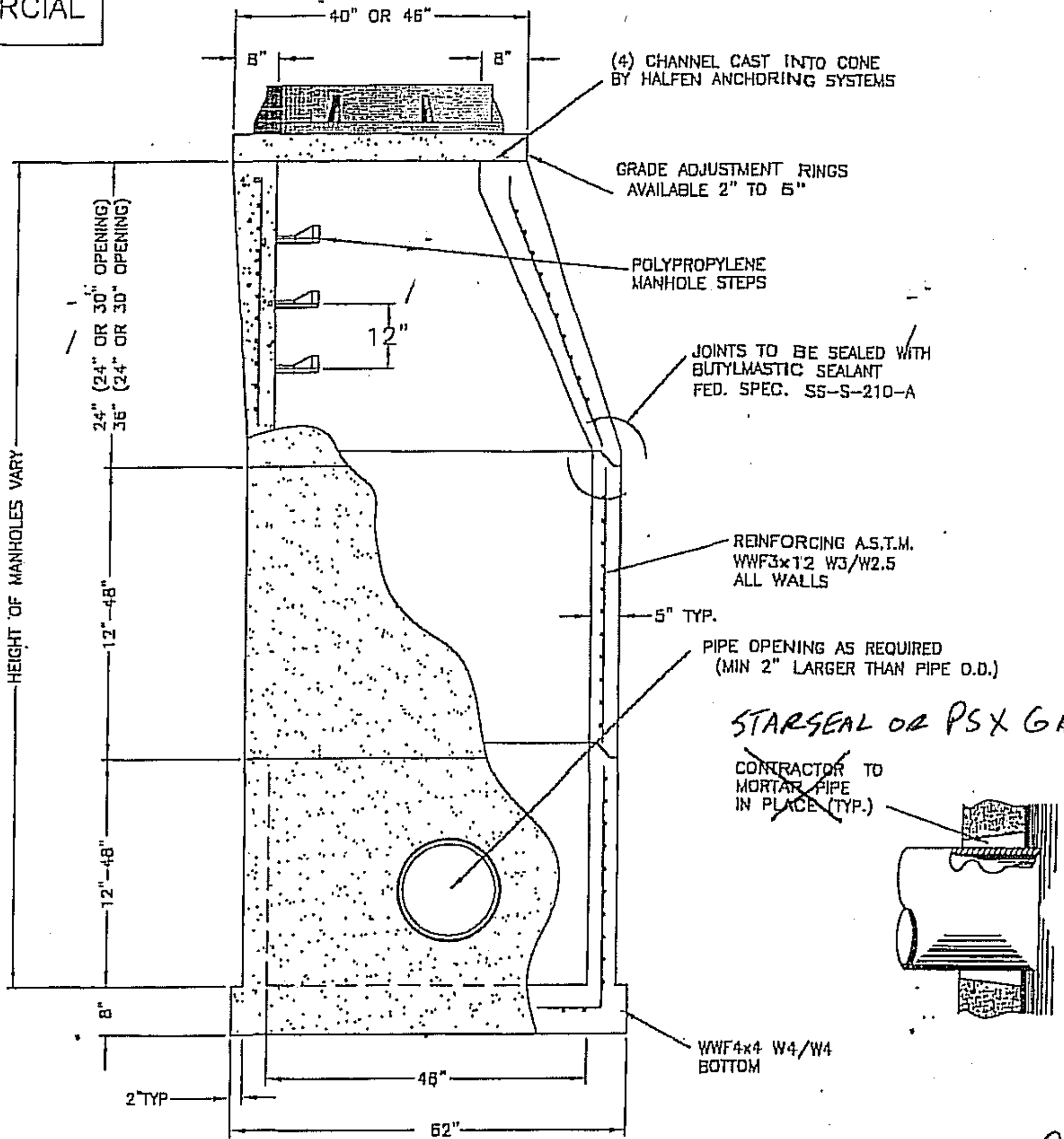
GRATE SECTION

EJIW EAST JORDAN IRON WORKS EST. 1883

800–626–4653
www.ejiw.com
MADE IN USA

PRODUCT NUMBER	**45660033**
CATALOG NUMBER	**V-5660**
CATCH BASIN GRATE	
LOAD RATING	**HEAVY DUTY**
COATING	**UNDIPPED**
ESTIMATED WEIGHT	GRATE: 190 LBS
MATERIAL SPECIFICATION	GRATE – GRAY IRON ASTM A48 CL35B
OPEN AREA	390 SQ IN
√ DESIGNATES MACHINED SURFACE	
DRAWN: DEW	DATE: 07/29/02
LAST REVISED: SBB	DATE: 08/02/06
REFERENCE INFORMATION	4566033.2C 4566033.1D

COMMERCIAL



CB-4A, 12

BASE SECTION ONLY

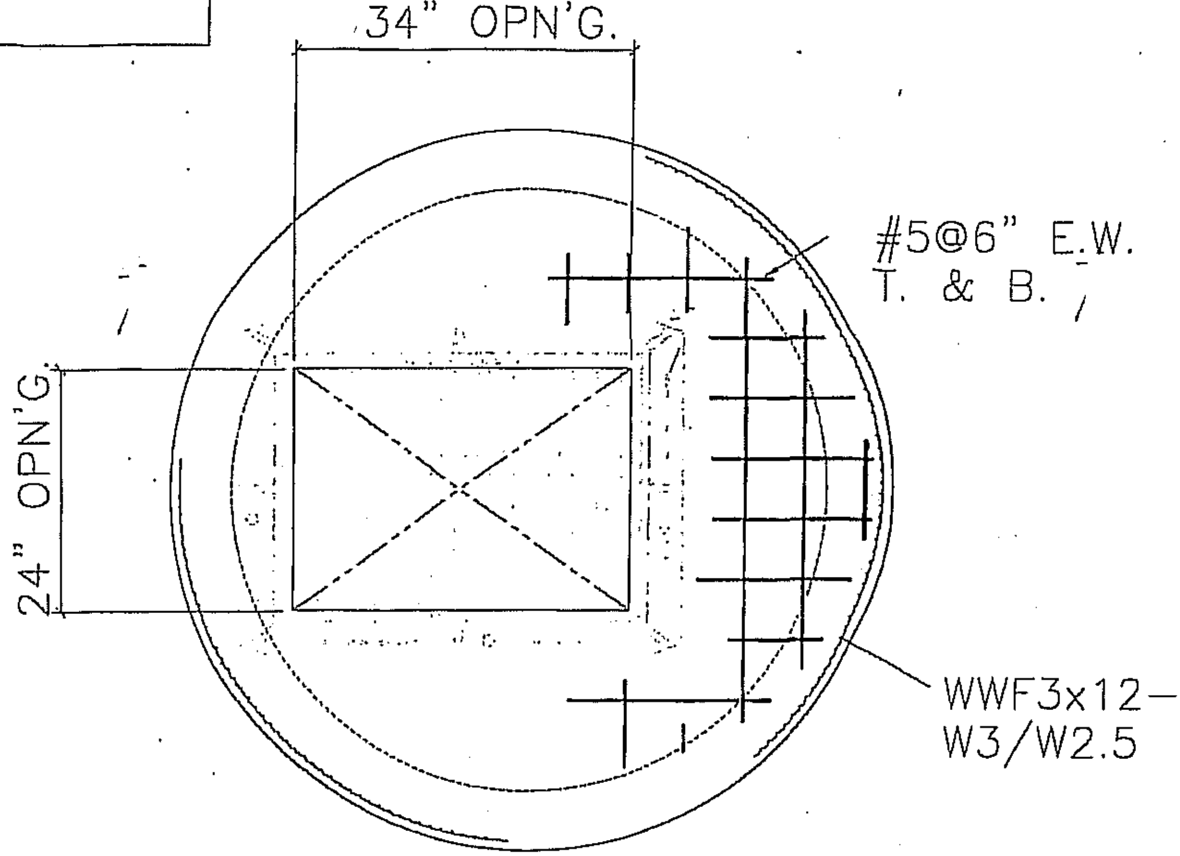
SPECIFICATIONS
MINIMUM CONCRETE STRENGTH 4000 PSI @28 DAYS (PENN DOT CLASS AA)
STEEL REINFORCEMENT –ASTM A185 VERTICAL WALLS STEEL AREA 0.12 IN.^{2}/VERTICAL FOOT.
HORIZONTAL BASE SLAB STEEL AREA 0.13 IN.^{2}/HORIZONTAL FOOT.
1 1/2" MINIMUM CONCRETE COVER (ALL REINFORCEMENT)
MANHOLE DESIGN SPECIFICATIONS CONFORMS TO "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS" ASTM C478, LATEST REVISIONS

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

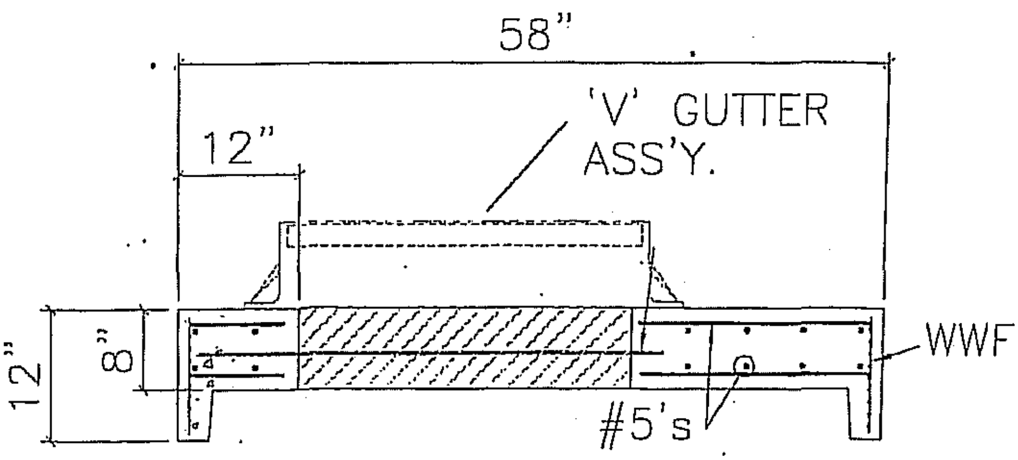
48" DIA. STORM MANHOLE

SIGNATURE OF APPROVAL	DATE	RRP	DWG	STRUCTURE
	9/23/04		48STMHCOMM	

MAX.SECTION WEIGHT



CB 4A, 12

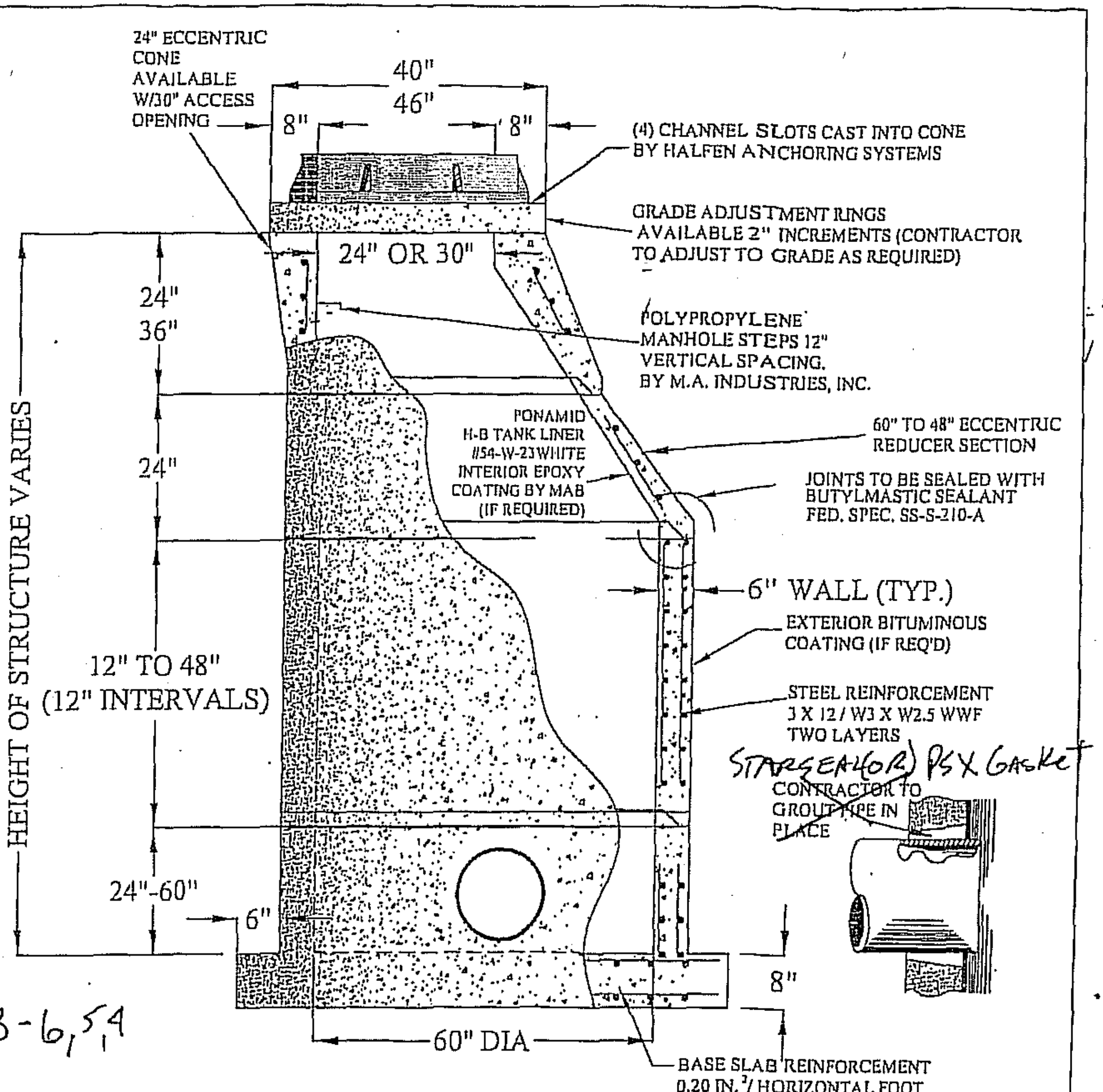


SPECIFICATIONS
*MATERIAL AND CONSTRUCTION SHALL COMPLY WITH NJ D.O.T.
*NJ DOT CLASS B CONCRETE 4500 P.S.I. @ 28 DAYS
*REINFORCEMENT~ A.S.T.M. A615 GRADE 60, MIN. 1 1/2" COVER U.N.O.

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

CORNELL DUBILIER SUPERFUND SITE
SOUTH PLAINFIELD, N.J.
SEVENSON ENVIREMENTAL SERVICES
ø48" INLET LID

DATE	RRP	DWG	STRUCTURE
4/11/11		1187-4A	4A



CB - 6, 5, 4

BASE AND RISER ONLY

SPECIFICATIONS

MINIMUM CONCRETE STRENGTH PENN DOT CLASS AA -4000 PSI @28 DAYS

STEEL REINFORCEMENT -ASTM A185 VERTICAL WALLS STEEL AREA 0.12 IN^2/VERTICAL FT.-(48" DIA.) & 0.15 IN^2/VERTICAL FT. -(60"DIA.)HORIZONTAL BASE SLAB STEEL AREA 0.20 IN^2/HORIZONTAL FT. (1 1/2" MINIMUM CONCRETE COVER)

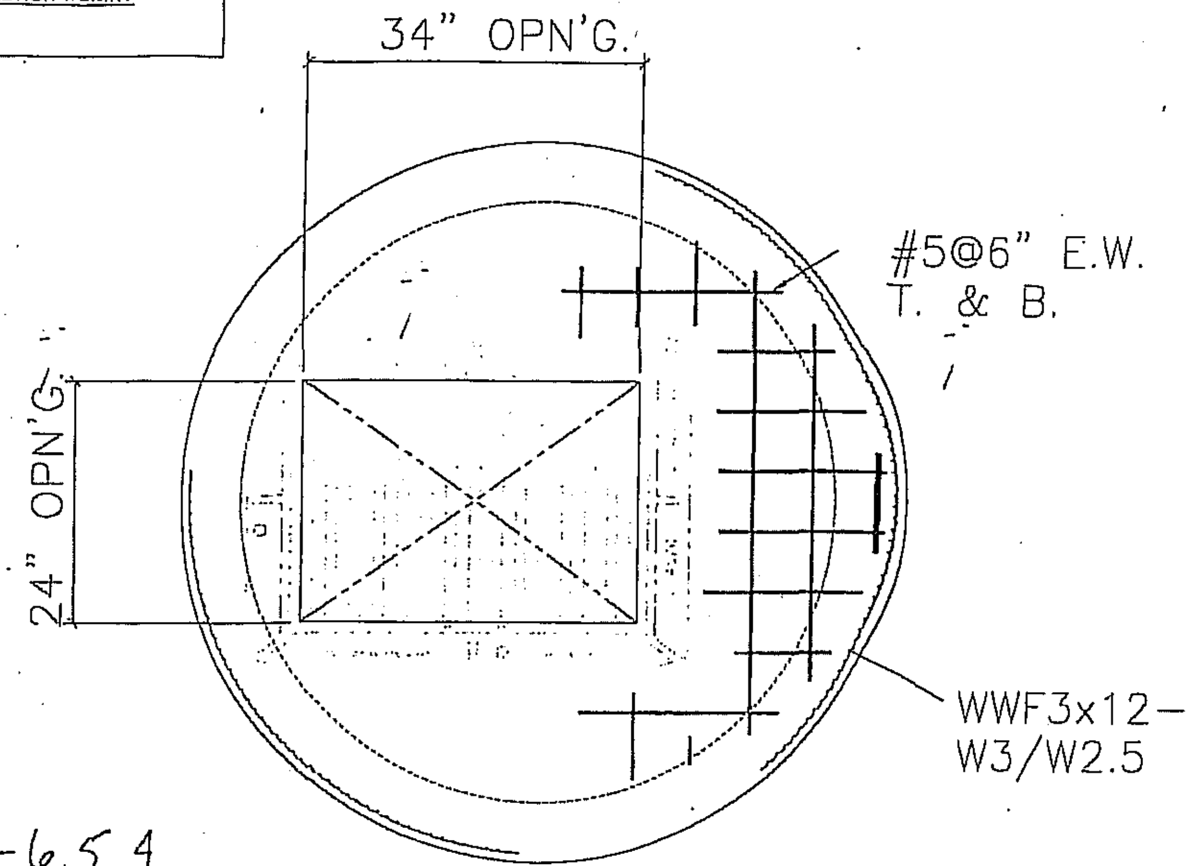
MANHOLE DESIGN SPECIFICATIONS CONFORMS TO "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS" ASTM C478, LATEST REVISIONS

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

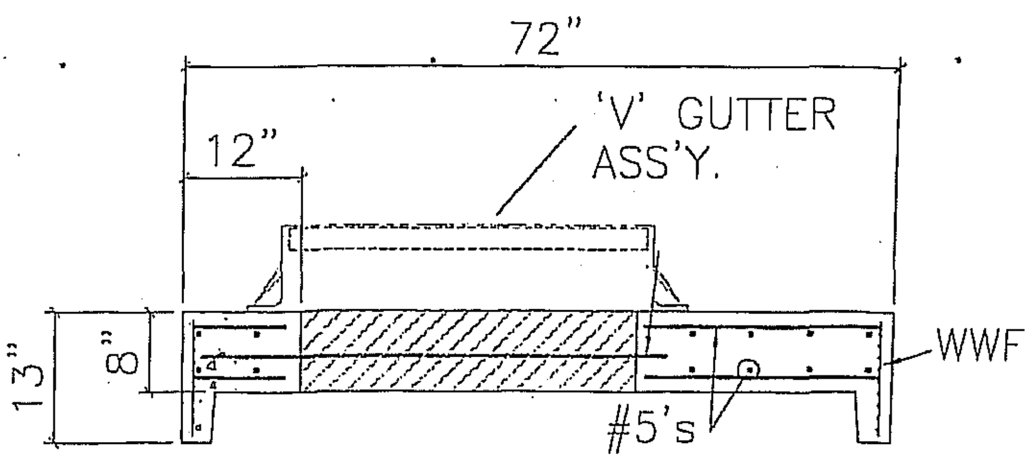
60" DIA. STORM MANHOLE w/6" EXT. BASE

DATE:	SIGNATURE OF APPROVAL	DWG NO.	NAME:
2-00		60STMH6X	BTH

MAX.SECTION WEIGHT



CB-6,5,4



SPECIFICATIONS

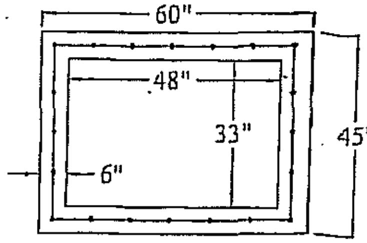
*MATERIAL AND CONSTRUCTION SHALL COMPLY WITH NJ D.O.T.
*NJ DOT CLASS B CONCRETE 4500 P.S.I. @ 28 DAYS
*REINFORCEMENT~ A.S.T.M. A615 GRADE 60, MIN. 1 1/2" COVER U.N.O.

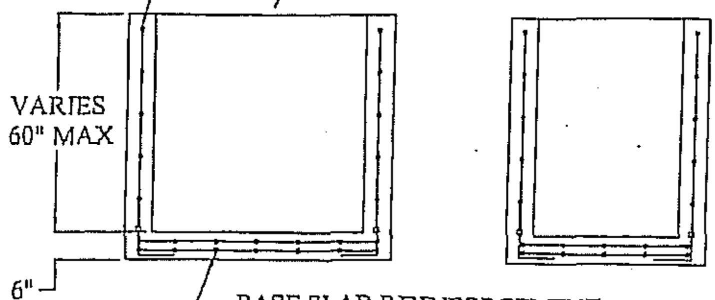
Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

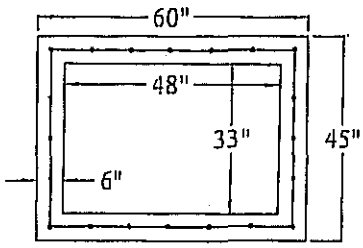
CORNELL DUBILIER SUPERFUND SITE
SOUTH PLAINFIELD, N.J.
SEVENSON ENVIREMENTAL SERVICES
ø60" INLET LID

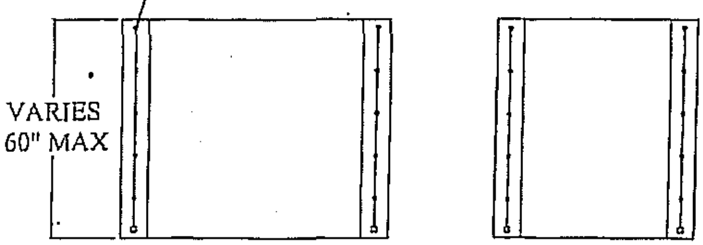
DATE	RRP	DWG	STRUCTURE
4/11/11		1187-4	4

CB-8,16









SPECIFICATIONS

MATERIAL AND CONSTRUCTION SHALL COMPLY WITH PENN D.O.T. PUB. 408
CLASS AA CONCRETE 4000 P.S.I. @ 28 DAYS
REINFORCEMENT– A.S.T.M. A615 GRADE 60, MIN. 1 1/2" COVER.
LOCATION OF PIPE OPENING AS REQUIRED.
BOXES AND RISER FABRICATED IN 6" INCREMENTS
ADDITIONAL REINFORCEMENT TO BE SUPPLIED FOR COMBINED HEIGHTS OF INLET BOX AND RISER OVER 9'-0"

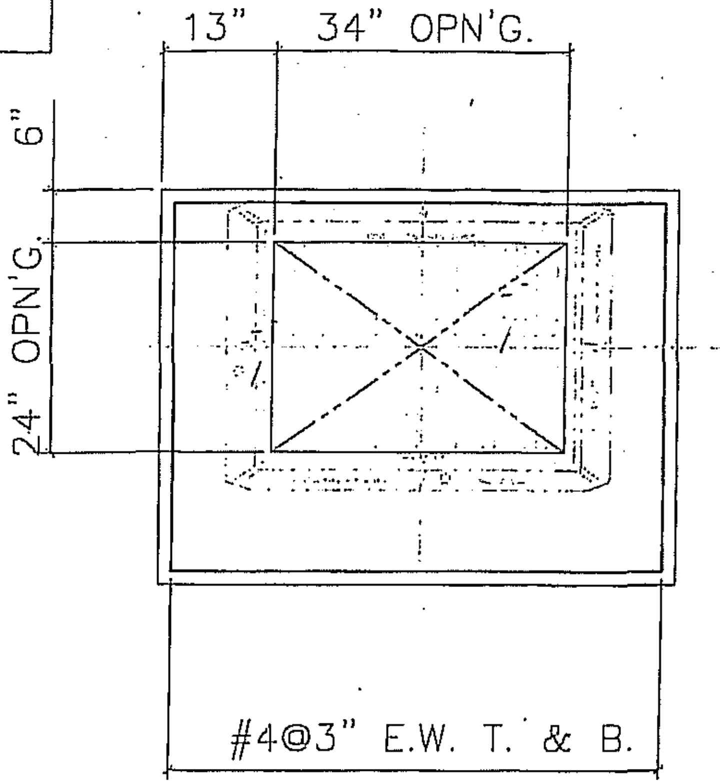
Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

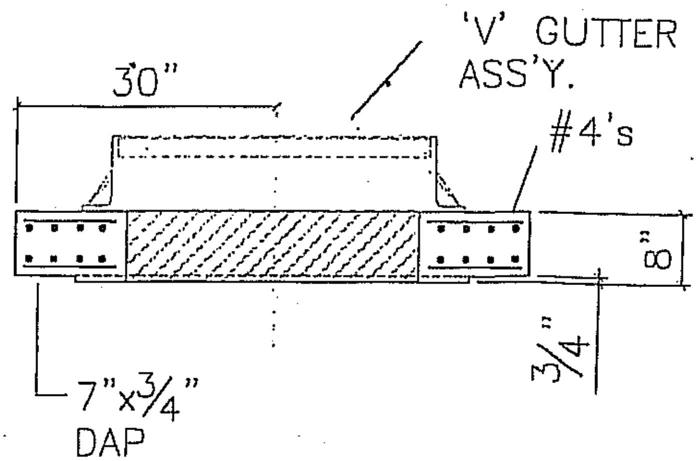
33" X 48" PRECAST INLET BOX AND RISER

DATE:	SIGNATURE OF APPROVAL	DWG NO.	NAME:
6-00		CTLST0028	BTH

MAX.SECTION WEIGHT

CB-8,16





SPECIFICATIONS

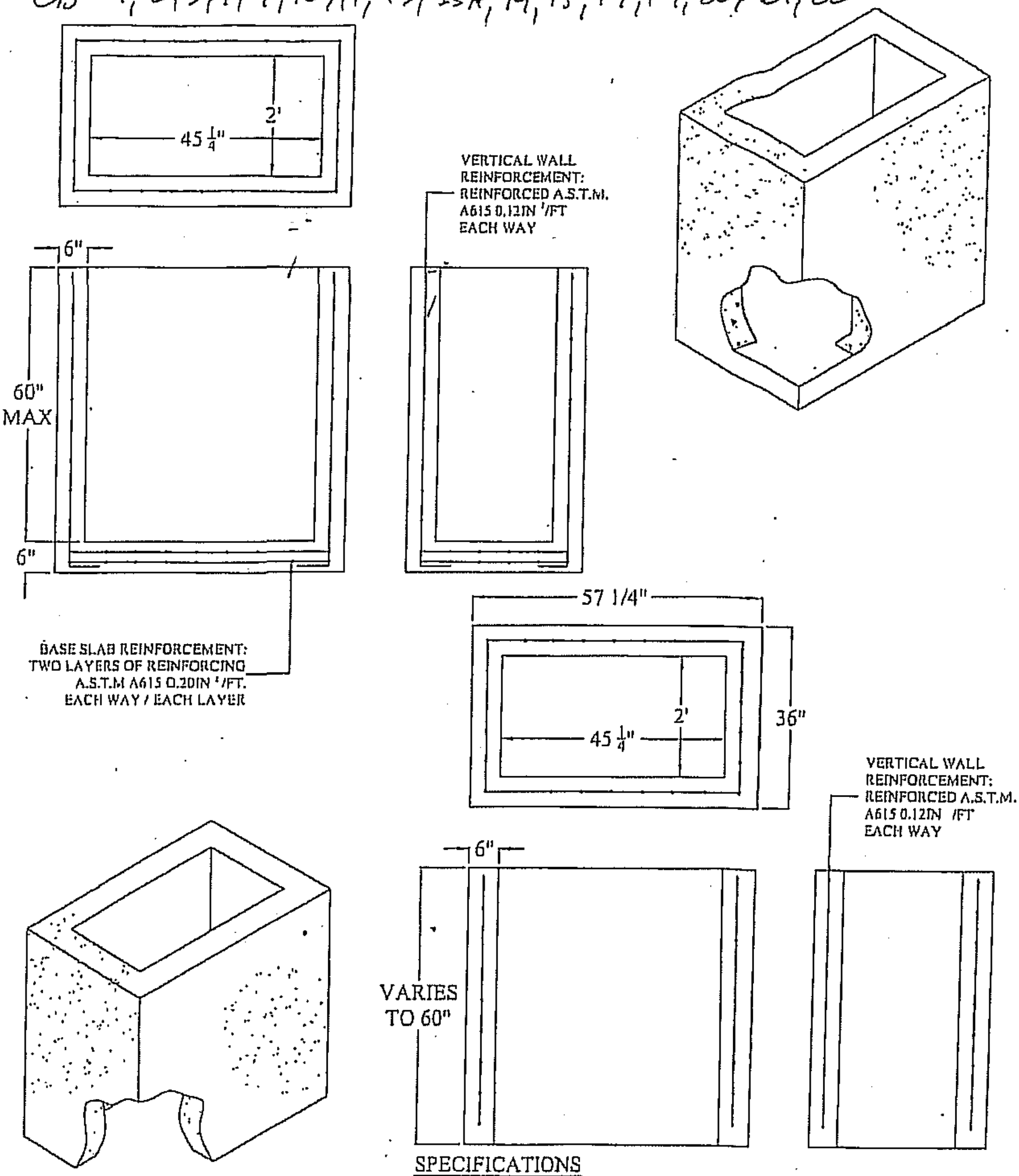
- *MATERIAL AND CONSTRUCTION SHALL COMPLY WITH NJ D.O.T.
- *NJ DOT CLASS B CONCRETE 4500 P.S.I. @ 28 DAYS
- *REINFORCEMENT~ A.S.T.M. A615 GRADE 60, MIN. 1 1/2" COVER U.N.O.

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

CORNELL DUBILIER SUPERFUND SITE
SOUTH PLAINFIELD, N.J.
SEVENSON ENVIREMENTAL SERVICES
33"'x48" INLET LID

DATE	RRP	DWG	STRUCTURE
4/11/11		1187-816	8,16

CB-1, 2, 3, 7, 9, 10, 11, 13, 13A, 14, 15, 17, 19, 20, 21, 22



SPECIFICATIONS

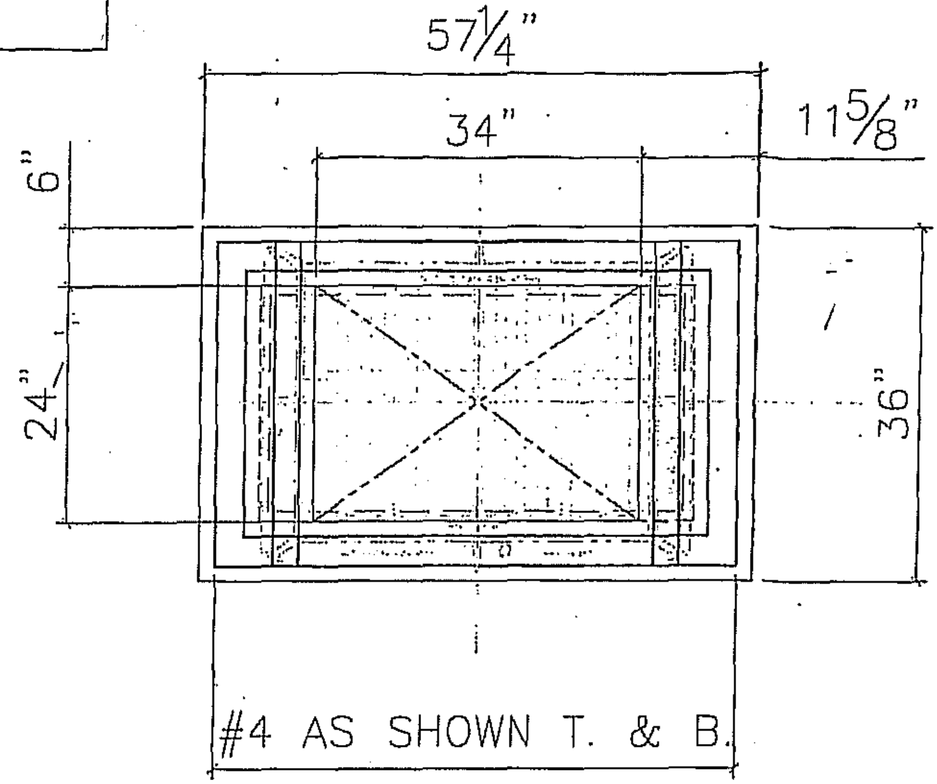
MATERIAL AND CONSTRUCTION SHALL COMPLY WITH PENN D.O.T. PUB 408
PENNDOT CLASS AA CONCRETE 4000 P.S.I. @ 28 DAYS
REINFORCEMENT- A.S.T.M. A 615 GRADE 60, MIN. 1 1/2" COVER.
LOCATION OF PIPE OPENING AS REQUIRED.
BOXES AND RISERS FABRICATED IN 6" INCREMENTS
MEETS H-25 LOAD REQUIREMENTS

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

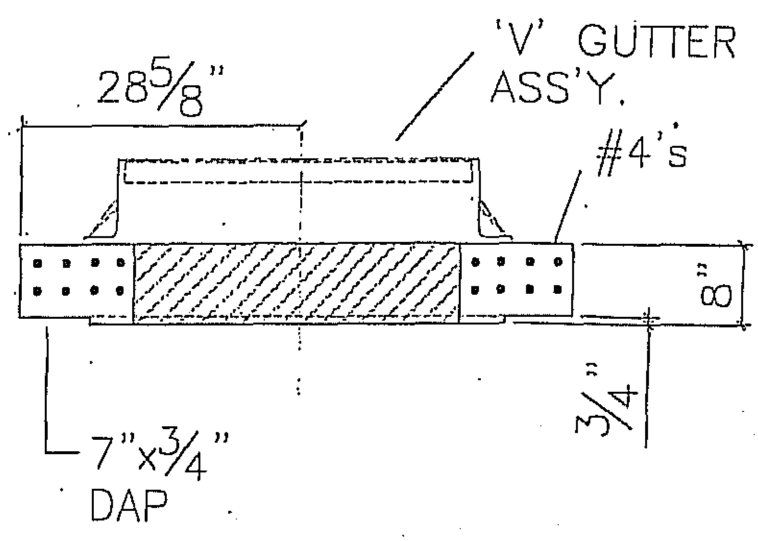
STANDARD 24" x 45 1/4" INLET BOX & RISER SECTION

DATE:	SIGNATURE OF APPROVAL	DWG NO.	NAME:
2-00		ST07	BTH

MAX.SECTION WEIGHT



CB-1,2,3,7,9,10,11,13,13A,14,15,17,19,20,21,22



SPECIFICATIONS

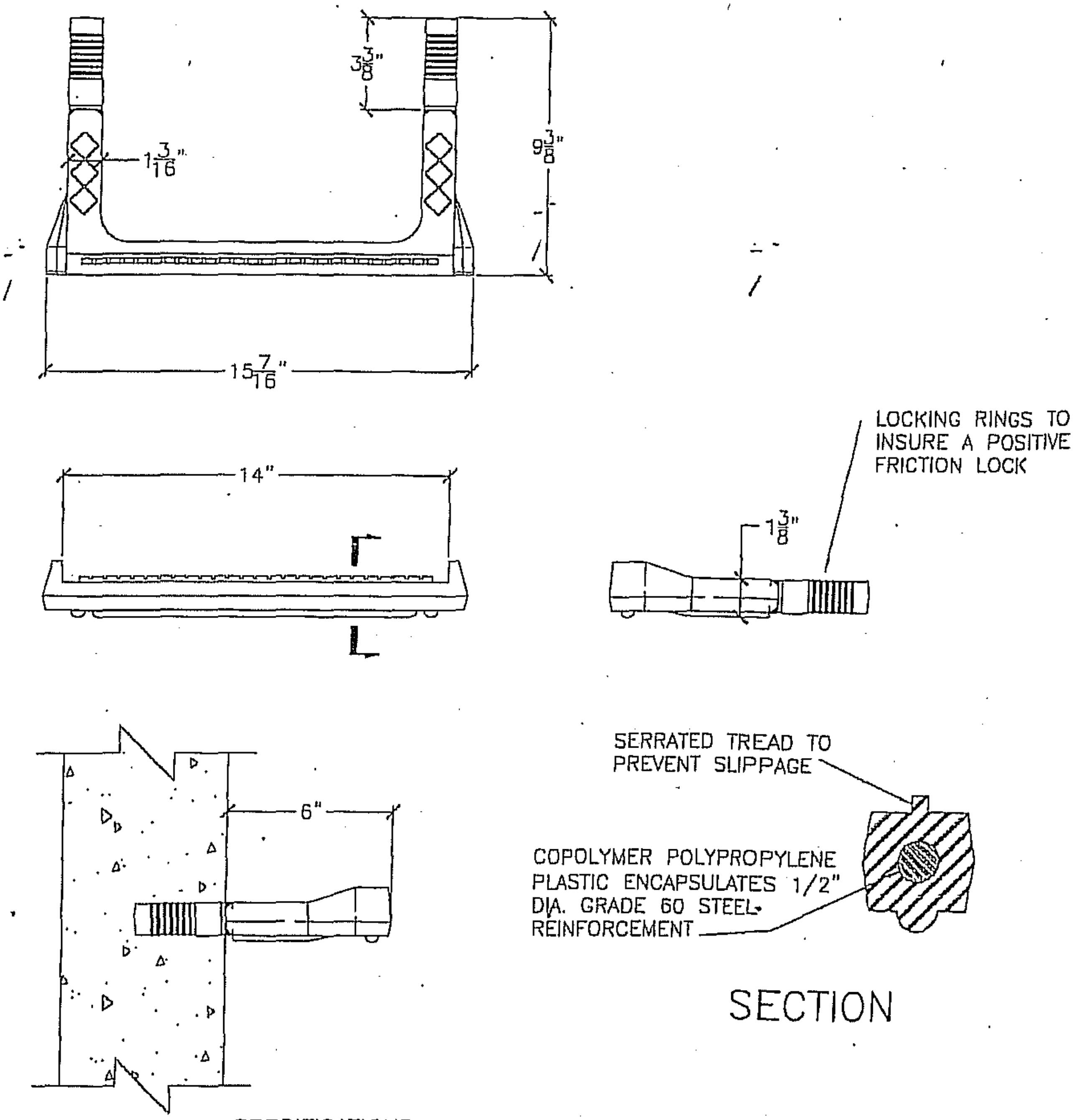
*MATERIAL AND CONSTRUCTION SHALL COMPLY WITH NJ D.O.T.
*NJ DOT CLASS B CONCRETE 4500 P.S.I. @ 28 DAYS
*REINFORCEMENT~ A.S.T.M. A615 GRADE 60, MIN. 1 1/2" COVER U.N.O.

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

CORNELL DUBILIER SUPERFUND SITE
SOUTH PLAINFIELD, N.J.
SEVENSON ENVIREMENTAL SERVICES
2'x4' INLET LID

DATE	RRP	DWG	STRUCTURE
4/11/11		1187-24	MULTI

ALL CB'S OVER 4VF



SPECIFICATIONS

PENNDOT BULLETIN 15 APPROVED
MEETS ASTM C478, D4101, A615, & AASHTO M199
MANUFACTURED BY M.A. INDUSTRIES INC. #PS-2PF AND #PS-2B MANHOLE STEP OR EQUAL
SUPERIOR RESISTANCE TO ALL TYPES OF CORROSIVE ENVIRONMENTS FOUND IN SEWERS
RESISTANT TO PULLOUT FORCE OF OVER 1500 POUNDS
DESIGNED TO PREVENT FOOT SLIPPAGE WITH NORMAL USE

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

POLYPROPYLENE MANHOLE AND INLET STEPS

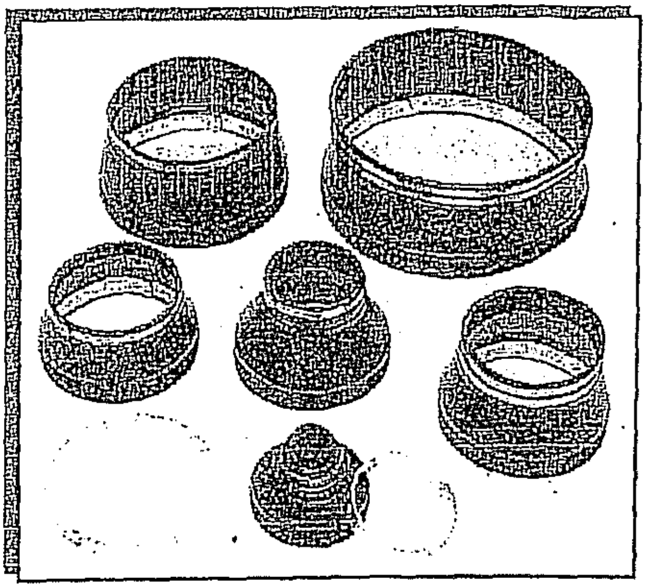
SIGNATURE OF APPROVAL	DATE	RRP	DWG	STRUCTURE
	3/27/06		STEPS	

SEE PRODUCTION DRAWINGS

PSX

Providing products and services that protect our planet's clean water supply

POSITIVE SEAL GASKET SYSTEM WITH POWER SLEEVE EXPANSION



PRESS-SEAL GASKET CORPORATION

P.O. Box 10482, Fort Wayne, Indiana 46852

Phone: (260) 436-0521 (800) 348-7325 Fax: (260) 436-1908 E-mail: sales@press-seal.com Web: www.press-seal.com

PSX

Our original PSX; POSITIVE SEAL pipe-to-manhole flexible connector system. PSX is available for 8" and larger holes to seal the most commonly used pipe types and sizes.

PSX ADVANTAGES

- Meets and/or exceeds Material Specifications of ASTM C-923.
- Type 304 Stainless Steel Compression Power Sleeve is one piece with no welds. Made with 10 and 11 gauge steel.
- Highest installation pressures, 2500 to 6000 PSI. The more PSI force, the better the initial and long term seal.
- Gasket is made of high quality Polyisoprene rubber. Provides greater deflection capabilities and greater tear resistance.
- Type 304 Stainless Steel Take-Up Clamps.
- For use with cored holes, or our fiberglass, or Pro-Former Hole Formers.

TEST	ASTM METHOD	TEST REQUIREMENTS	TEST RESULTS
CHEMICAL RESISTANCE; 1N SULFURIC ACID 1N HYDROCHLORIC ACID	D 534, AT 22°C FOR 48 HRS	NO WEIGHT LOSS NO WEIGHT LOSS	NO WEIGHT LOSS NO WEIGHT LOSS
TENSILE STRENGTH	D 412	1200 PSI, MIN.	2600 PSI
ELONGATION AT BREAK	D 412	350%, MIN.	675%
HARDNESS	D 2240 (SHORE A DUROMETER)	±5 FROM THE MANUFACTURER'S SPECIFIED HARDNESS	45
ACCELERATED OVEN-AGING	D 573, 70± 1°C FOR 7 DAYS	DECREASE OF 15%, MAX. OF ORIGINAL TENSILE STRENGTH, DECREASE OF 20%, MAX. OF ELONGATION	-13% TENSILE CHANGE, -14% ELONGATION CHANGE
COMPRESSION TEST	D 395, METHOD B, AT 70°C FOR 22 HRS	DECREASE OF 25%, MAX. OF ORIGINAL DEFLECTION	13.20%
WATER ABSORPTION	D 471 IMMERSE 0.75 BY 2-IN. SPECIMEN IN DISTILLED WATER AT 70°C FOR 48 HOURS	INCREASE OF 10%, MAX. OR ORIGINAL BY WEIGHT	3.50%
OZONE RESISTANCE	D 1171	RATING 0	PASS
LOW-TEMP, BRITTLE POINT	D 746	NO FRACTURE AT -40°C	PASS
TEAR RESISTANCE	D 624, METHOD B	200 LBF/IN. (MIN.)	318 LBF/IN.

PIPE INSTALLATION

1. Clean pipe and boot to ensure no dirt or foreign materials are present.
2. Clamping surface on pipe must be clean and smooth.
3. Center pipe in opening and insert until pipe breaks the inside plane of manhole.
4. Attach take-up clamp(s) and stagger screw(s) of clamp(s) around the groove of the gasket so that take-up pressure will be equalized. Make sure each clamp is completely in the correct groove.
5. Using a torque ratchet or torque wrench, gradually tighten all screw(s) of clamp(s) in an alternating pattern to 60lbs/in torque.
6. After reaching 60lbs/in torque on final screw, check all screws again to ensure equal compression of all clamps.
7. Vacuum testing shall be conducted in accordance with ASTM C-1244-02.
8. Adjust pipe to line and grade. Use proper bedding, backfill materials and techniques so that pipe deflection and deformation is minimized. Installation of the concrete structure shall be such that differential settlement between the structure and the pipeline shall be less than 10% of pipe diameter for pipes less than 20" and shall be less than 5% of pipe diameter for pipes between 20 and 60 inches in diameter.
9. Any pipe stubs installed in the manhole must be positively restrained from movement per ASTM C-923. Press-Seal is not responsible for blow outs due to unrestrained pipe stub or future lateral connections.

Before using the PSX-POSITIVE SEAL system for any custom applications, contact our Customer Service Department for more information.

U.S. Patent No.'s 4215860, 4470437

Press-Seal believes all information is accurate as of its publication date. Information, specifications, and prices are all subject to change without notice. Press-Seal is not responsible for any inadvertent errors.

PRESS-SEAL GASKET CORPORATION

P.O. Box 10482, Fort Wayne, Indiana 46852

Phone: (260) 436-0521 (800) 348-7325 Fax: (260) 436-1908 E-mail: sales@press-seal.com Web: www.press-seal.com

SEE PRODUCTION DRAWINGS

★STAR SEAL★

"RUBBERMAN"

PIPE-TO-MANHOLE SEAL

1. MEETS ASTM 923-C SPECIFICATIONS
2. RUBBER MEETS ASTM 443.
3. 20° OMNI-DIRECTIONAL DEFLECTION.
4. ACCOMMODATES PIPE OD'S FROM 3" AND UP.
5. AS SIMPLE AS LUBRICATING PIPE AND GASKET AND INSERTING PIPE.
6. MAY BE USED IN ROUND OR SQUARE STRUCTURES.
7. ACCOMMODATES SANITARY OR STORM SEWER SITUATIONS.
8. A COMPRESSION SEAL INTEGRALLY CAST INTO THE STRUCTURE.
9. HAS BEEN SUCCESSFULLY USED FOR PIPE ENTRY IN SANITARY SEWERS, STORM SEWERS, SEPTIC TANKS, AND WALLS OF TREATMENT PLANTS.
10. "RUBBERMAN I" LUBRICANT IS SUGGESTED AS AN ENVIRONMENTALLY FRIENDLY PRODUCT TO FACILITATE INSTALLATION PROCEDURES.
11. CAST IN STRUCTURE USING TWO-PIECE STEEL RINGS. ELIMINATING AN "OUT OF ROUNDNESS"SITUATION COMMON WITH FIBERGLASS RINGS.
12. CONSULTATION AVAILABLE CONCERNING ANY ANTI INFILTRATION-EXFILTRATION PROJECT.
13. OVER 40 YEARS EXPERIENCE DESIGNING, TESTING, MARKETING, AND SERVICING SEALS FOR MANUFACTURES OF PIPE, MANHOLES, SEPTIC TANKS, PUMP STATIONS, AND TREATMENT PLANTS.
14. "RUBBERMAN" IS A TRADE NAME FOR O RING, PROFILE GASKETS, PIPE TO MANHOLE SEALS; LUBRICANT, SEALANT, AND THE NEW PRECAST SEWER CHIMNEY AND PIPE ENCASEMENT SYSTEM.

NOTE:

ALL STAR-SEAL™ PIPE-TO-MANHOLE GASKETS ARE
MANUFACTURED BY: HAIL MARY RUBBER CO. INC. WARMINSTER, PA.
DISTRIBTED BY:CONTINENTAL CONCRETE PRODUCTS INC. POSSTOWN, PA.

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

STAR-SEAL™ COMPRESSION GASKET SPECIFICATION SHEET

DATE:	SIGNITURE OF APPROVAL	DWG NO.	NAME:
6-00		SA12	BTH

ALL CB 48" dia & 60" Dia

11/06/03

MultiSeal, Inc. Designed Sealant and Adhesive Technologies

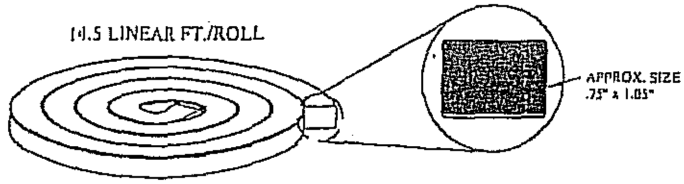
Corporate Office & Mfg. 4320 Hirch and Peters Road Evansville, IN 47711 • Tel. (812) 428-3422 • Fax. (812) 428-3432
R & D / Compounding. 2131 Commercial Ct. Evansville, IN 47720 • Tel. (812) 428-3443 • Fax. (812) 428-3445

TECHNICAL DATA

Product number:	MP1255	
Description	Higher density polymer-based mastic used to seal most clean substrates against moisture, dust, and air. Substrates include concrete, metal, plastic, and other surfaces.	
ASTM C990	Meets ASTM C990 specification for Butyl Rubber Sealant	
	Specification Requirement	Typical Results
Butyl Rubber (hydrocarbon blends)	50 % minimum	54 %
Ash-Inert Mineral Matter	30% minimum	44
Volatile Matter	2 % maximum	<2 %
Specific Gravity at 77°F	1.15 minimum, 1.50 maximum	1.36
Ductility at 77°F, cm	5.0 minimum	8
Flash Point, C.O.C.	350 °F minimum	>500 °F
Fire Point, C.O.C.	375 °F minimum	>500 °F
Rebound Test at 77°F	3 % to 15 %	5.2
at 32°F	3 % to 20 %	5.8
Compression Test at 77°F, lbf/in.^{2}	100 maximum	91
at 32°F, lbf/in.^{2}	200 maximum	128
Low Temperature Flexibility at -10°F	180° bend, no cracking and no loss of adhesion	Pass
Elevated Temperature Flow, 14 days at 158°F	No sag, and no change in extruded shape	Pass
Adhesion after impact	No greater loss than 50 % of adhesion	Pass
Cone Penetration at 77°F, dmm	50 to 100	80-95
at 32°F, dmm	40 minimum	50
Chemical Resistance	No deterioration, cracking, or swelling	Pass
Shelf life	Minimum 1 year	

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

14.5 LINEAR FT./ROLL



MANHOLE PRODUCTION SHEET - REV. A 8/25/05

PAGE 1 OF 4

JOB QUOTE# 11-87 STRUCTURE DEPTH 8.50 CUSTOMER: Sevenson Environmental

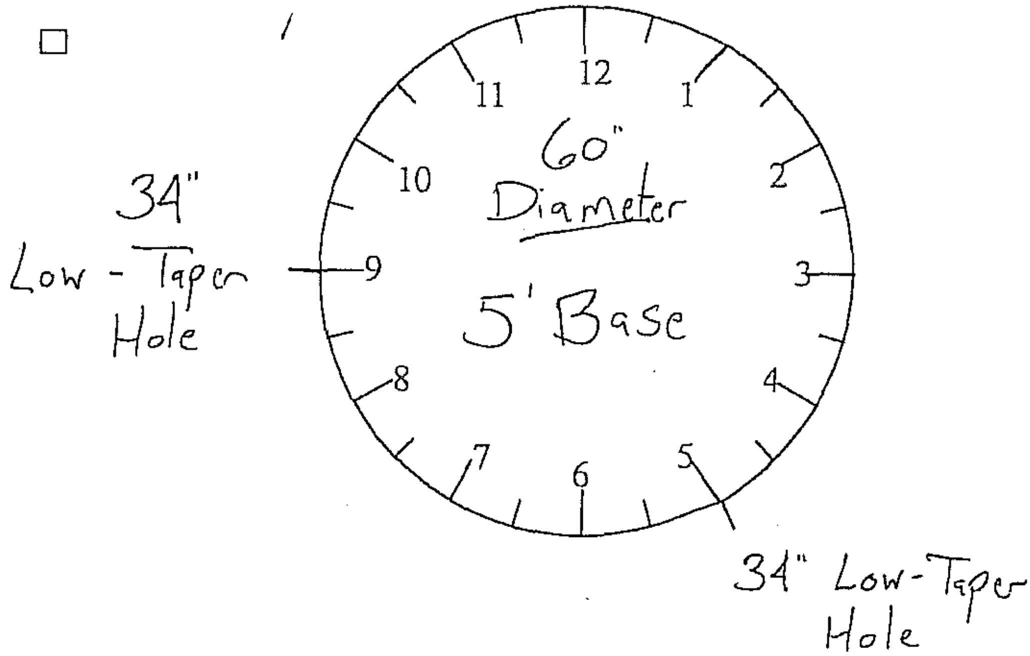
PROD. DATE ______ BASE HEIGHT: ______ JOB NAME: Cornell-Dubilier Superfund Site

DELIVERY DATE ______ FLOW CHANNELS YES ☐ NO ☐ STRUCTURE# CB 6

COMMERCIAL ☑

PENNDOT ☐

PWD ☐



1'-0" MANHOLE RISER [48" DIA]		MH FLAT LID (W/24"o) [48" DIA.]		MH FLAT LID (W/24"o) [60" DIA.]	
2'-0" MANHOLE RISER [48" DIA]		MH FLAT LID (W/30"o) [48"DIA.]		MH FLAT LID (W/30"o) [60" DIA.]	
3'-0" MANHOLE RISER [48" DIA]				1'-0" MANHOLE RISER [72" DIA]	
4'-0" MANHOLE RISER [48" DIA]		2'-0" REDUCER CONE [60"TO48"]		2'-0" MANHOLE RISER [72" DIA]	
2'-0" MH CONE (W/24"o)		1'-0" MANHOLE RISER [60" DIA]		3'-0" MANHOLE RISER [72" ID]	
2'-0" MH CONE (W/30"o)		2'-0" MANHOLE RISER [60" DIA]	X	4'-0" MANHOLE RISER [72" ID]	
3'-0" MH CONE (W/24"o)		3'-0" MANHOLE RISER [60" DIA]		MH FLAT LID (W/24"o) [72" DIA.]	
3'-0" MH CONE (W/30"o)		4'-0" MANHOLE RISER [60" DIA]		MH FLAT LID (W/30"o) [72" DIA.]	

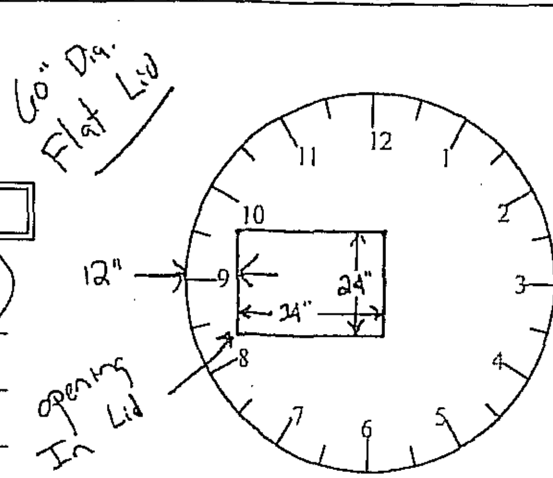
NO EXTERIOR COATING		EXTERIOR COATING (BLACK)	
EXTERIOR EPOXY (TAN)		INTERIOR EPOXY (WHITE)	
NO MH FRAME & COVER		24" MH F/C "STORM"	
MH JT. SEALANT (ROLLS)	3	30" MH F/C STORM	

M.H. FRAME / COVER

ADDITIONAL INFORMATION:

26" x 36" Special F+G (TYPE 1)

(2) 34L PSX-2 Boots



MANHOLE PRODUCTION SHEET - REV. A 8/25/05

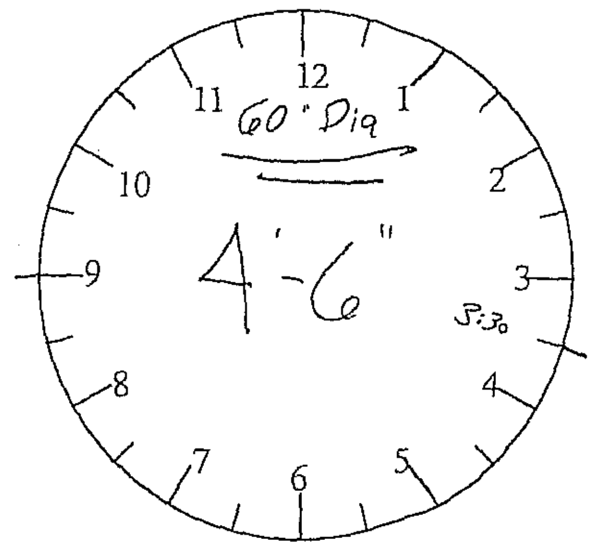
JOB QUOTE: 11-87 STRUCTURE DEPTH: 8.10 CUSTOMER: Sevenson Environmental

PROD DATE: ______ BASE HEIGHT: ______ JOB NAME: Cornell-Dubilier Superfund Site

DELIVERY DATE: ______ FLOW CHANNELS YES ☐ NO ☑ STRUCTURE# CB 5

COMMERCIAL ☑
PENNDOT ☐
PWD ☐

34" Low-Taper Hole



34" Low-Taper Hole

1'-0" MANHOLE RISER [48" DIA]		MH FLAT LID (W/24"o) [48" DIA.]		MH FLAT LID (W/24"o) [60" DIA.]	
2'-0" MANHOLE RISER [48" DIA]		MH FLAT LID (W/30"o) [48"DIA.]		MH FLAT LID (W/30"o) [60" DIA.]	
3'-0" MANHOLE RISER [48" DIA]				1'-0" MANHOLE RISER [72" DIA]	
4'-0" MANHOLE RISER [48" DIA]		2'-0" REDUCER CONE [60" TO 48"]		2'-0" MANHOLE RISER [72" DIA]	
2'-0" MH CONE (W/24"o)		1'-0" MANHOLE RISER [60" DIA]		3'-0" MANHOLE RISER [72" ID]	
2'-0" MH CONE (W/30"o)		2'-0" MANHOLE RISER [60" DIA]	X	4'-0" MANHOLE RISER [72" ID]	
3'-0" MH CONE (W/24"o)		3'-0" MANHOLE RISER [60" DIA]		MH FLAT LID (W/24"o) [72" DIA.]	
3'-0" MH CONE (W/30"o)		4'-0" MANHOLE RISER [60" DIA]		MH FLAT LID (W/30"o) [72" DIA.]	

NO EXTERIOR COATING		EXTERIOR COATING (BLACK)	
EXTERIOR EPOXY (TAN)		INTERIOR EPOXY (WHITE)	
NO MH FRAME & COVER		24" MH F/C "STORM"	
MH JT. SEALANT (ROLLS)	3	30" MH F/C STORM	

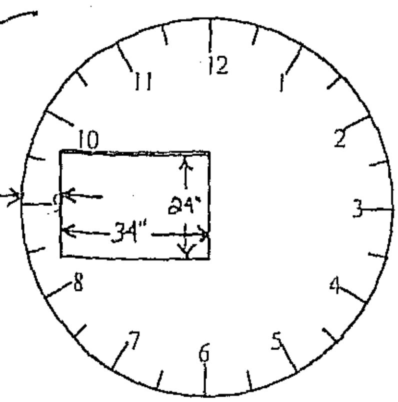
60" Dia Flat Lid

M.H. FRAME / COVER

ADDITIONAL INFORMATION:

26" x 36" Special Fr. + Gr. (TYPE 1)

(2) 34(L) PSX-2 Boot Gaskets



MANHOLE PRODUCTION SHEET - REV. A 8/25/05

JOB QUOTE# 11-87 STRUCTURE DEPTH 8.10 CUSTOMER: Sevenson Environmental

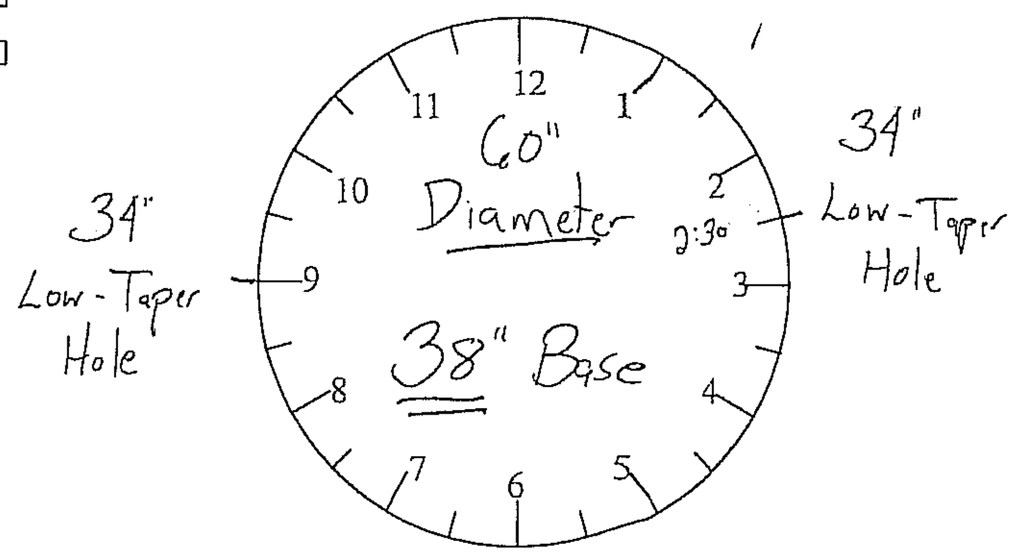
PROD DATE: ______ BASE HEIGHT: ______ JOB NAME: Cornell-Dubilier Superfund Site

DELIVERY DATE: ______ FLOW CHANNELS YES ☐ NO ☑ STRUCTURE# C.B 4 (1 of 2)

COMMERCIAL ☑

PENNDOT ☐

PWD ☐



1'-0" MANHOLE RISER [48" DIA]		MH FLAT LID (W/24"o) [48" DIA.]		MH FLAT LID (W/24"o) [60" DIA.]	
2'-0" MANHOLE RISER [48" DIA]		MH FLAT LID (W/30"o) [48"DIA.]		MH FLAT LID (W/30"o) [60" DIA.]	
3'-0" MANHOLE RISER [48" DIA]				1'-0" MANHOLE RISER [72" DIA]	
4'-0" MANHOLE RISER [48" DIA]		2'-0" REDUCER CONE [60"TO48"]		2'-0" MANHOLE RISER [72" DIA]	
2'-0" MH CONE (W/24"o)		1'-0" MANHOLE RISER [60" DIA]		3'-0" MANHOLE RISER [72" ID]	
2'-0" MH CONE (W/30"o)		2'-0" MANHOLE RISER [60" DIA]		4'-0" MANHOLE RISER [72" ID]	
3'-0" MH CONE (W/24"o)		3'-0" MANHOLE RISER [60" DIA]		MH FLAT LID (W/24"o) [72" DIA.]	
3'-0" MH CONE (W/30"o)		4'-0" MANHOLE RISER [60" DIA]		MH FLAT LID (W/30"o) [72" DIA.]	

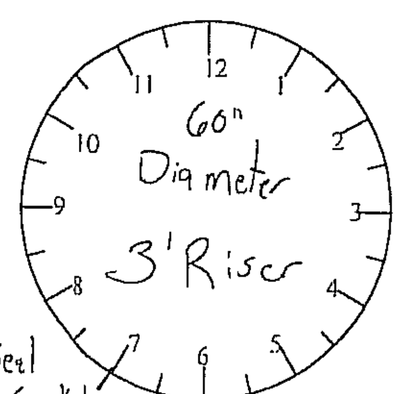
NO EXTERIOR COATING		EXTERIOR COATING (BLACK)	
EXTERIOR EPOXY (TAN)		INTERIOR EPOXY (WHITE)	
NO MH FRAME & COVER		24" MH F/C "STORM"	
MHJT SEALANT (ROLLS)		30" MH F.C STORM	

M.H. FRAME / COVER

ADDITIONAL INFORMATION:

26" x 36" Special Fr. + Grate (TYPE 1)

(2) 34L PSX-2 Boot Gaskets



Star-Seal #580 Gasket (up 5")

MANHOLE PRODUCTION SHEET - REV. A 8/25/05

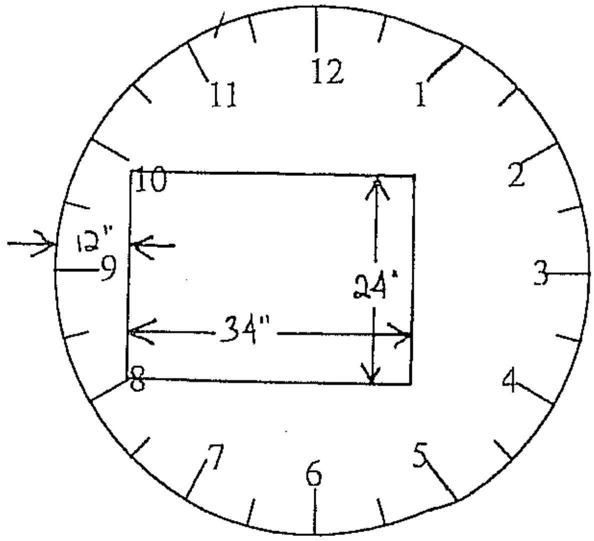
JOB QUOTE: 11-87 STRUCTURE DEPTH 8.10 CUSTOMER: Sevenson Environmental

PROD DATE: ______ BASE HEIGHT: ______ JOB NAME: Cornell-Dubilier Superfund Site

DELIVERY DATE: ______ FLOW CHANNELS YES ☐ NO ☑ STRUCTURE# CB 4 (2 of 2)

COMMERCIAL ☑
PENNDOT ☐
PWD ☐

60" Diameter Flat Lid

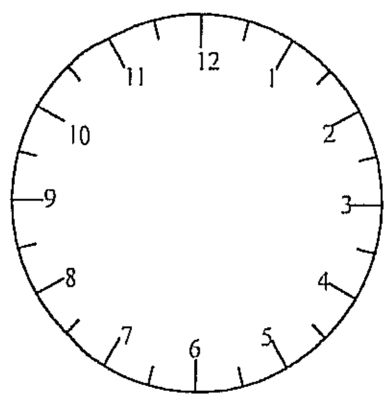


1'-0" MANHOLE RISER [48" DIA]		MH FLAT LID (W/24"o) [48" DIA.]		MH FLAT LID (W/24"o) [60" DIA.]	
2'-0" MANHOLE RISER [48" DIA]		MH FLAT LID (W/30"o) [48"DIA.]		MH FLAT LID (W/30"o) [60" DIA.]	
3'-0" MANHOLE RISER [48" DIA]				1'-0" MANHOLE RISER [72" DIA]	
4'-0" MANHOLE RISER [48" DIA]		2'-0" REDUCER CONE [60"TO48"]		2'-0" MANHOLE RISER [72" DIA]	
2'-0" MH CONE (W/24"o)		1'-0" MANHOLE RISER [60" DIA]		3'-0" MANHOLE RISER [72" ID]	
2'-0" MH CONE (W/30"o)		2'-0" MANHOLE RISER [60" DIA]		4'-0" MANHOLE RISER [72" ID]	
3'-0" MH CONE (W/24"o)		3'-0" MANHOLE RISER [60" DIA]		MH FLAT LID (W/24"o) [72" DIA.]	
3'-0" MH CONE (W/30"o)		4'-0" MANHOLE RISER [60" DIA]		MH FLAT LID (W/30"o) [72" DIA.]	

NO EXTERIOR COATING		EXTERIOR COATING (BLACK)	
EXTERIOR EPOXY (TAN)		INTERIOR EPOXY (WHITE)	
NO MH FRAME & COVER		24" MH F/C "STORM"	
MH JT. SEALANT (ROLLS)		30" MH F/C STORM	

M.H. FRAME / COVER

ADDITIONAL INFORMATION:



MANHOLE PRODUCTION SHEET - REV. A 8/25/05

JOB QUOTE# 11-87 STRUCTURE DEPTH 4.20 CUSTOMER: Sevenson Environmental

PROD. DATE: ________ BASE HEIGHT: ________ JOB NAME: Cornell-Dubilier Superfund Site

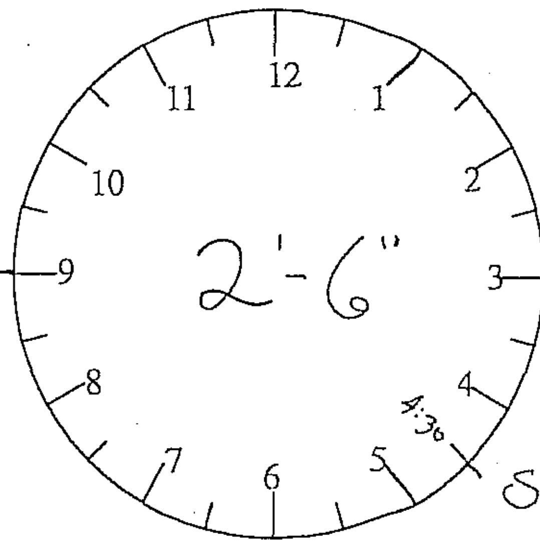
DELIVERY DATE: ________ FLOW CHANNELS YES ☐ NO ☑ STRUCTURE# 4A

COMMERCIAL ☑

PENNDOT ☐

PWD ☐

Star-Seal #580 Gasket

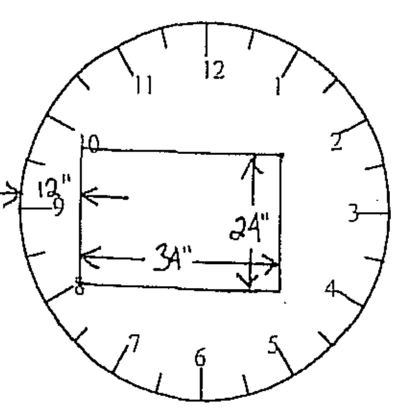


Star-Seal #580 Gasket

1'-0" MANHOLE RISER [48" DIA]		MH FLAT LID (W/24"o) [48" DIA.]		MH FLAT LID (W/24"o) [60" DIA.]	
2'-0" MANHOLE RISER [48" DIA]		MH FLAT LID (W/30"o) [48"DIA.]		MH FLAT LID (W/30"o) [60" DIA.]	
3'-0" MANHOLE RISER [48" DIA]				1'-0" MANHOLE RISER [72" DIA]	
4'-0" MANHOLE RISER [48" DIA]		2'-0" REDUCER CONE [60"TO48"]		2'-0" MANHOLE RISER [72" DIA]	
2'-0" MH CONE (W/24"o)		1'-0" MANHOLE RISER [60" DIA]		3'-0" MANHOLE RISER [72" ID]	
2'-0" MH CONE (W/30"o)		2'-0" MANHOLE RISER [60" DIA]		4'-0" MANHOLE RISER [72" ID]	
3'-0" MH CONE (W/24"o)		3'-0" MANHOLE RISER [60" DIA]		MH FLAT LID (W/24"o) [72" DIA.]	
3'-0" MH CONE (W/30"o)		4'-0" MANHOLE RISER [60" DIA]		MH FLAT LID (W/30"o) [72" DIA.]	

NO EXTERIOR COATING		EXTERIOR COATING (BLACK)	
EXTERIOR EPOXY (TAN)		INTERIOR EPOXY (WHITE)	
NO MH FRAME & COVER		24" MH F.C "STORM"	
MH JT. SEALANT (ROLLS)	1	30" MH F/C STORM	

48" Dia. Flat Lid



M.H. FRAME / COVER

ADDITIONAL INFORMATION:

26" x 36 Special Fr. & Grate (TYPE 2)

INLET PRODUCTION SHEET

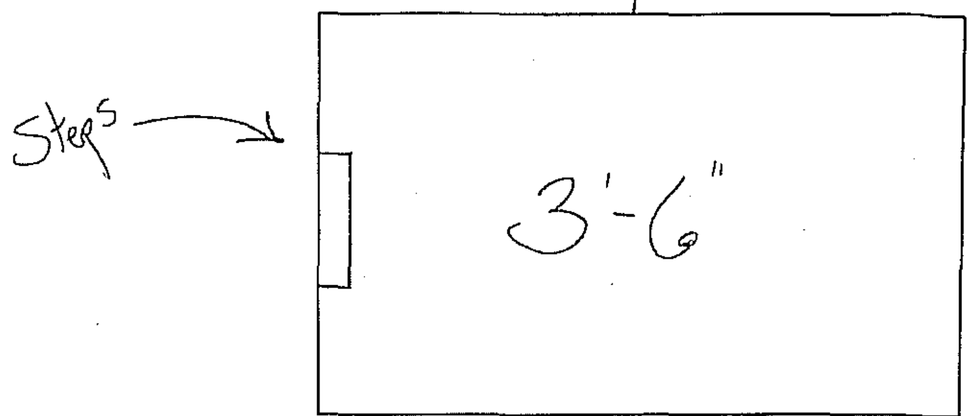
JOB QUOTE# 11-87 STRUCTURE DEPTH 5.02 CUSTOMER Sevenson Environmental

PROD. DATE: ________ BASE HEIGHT: ________ JOB NAME Cornell-Dubilier Superfund Site

DELIVERY DATE: ________ TOP TYPE Sp. Fr. + Gr. STRUCTURE# C.B 3

COMMERCIAL ☑
PENNDOT ☐
PWD ☐

Star-Seal
#580
Gasket

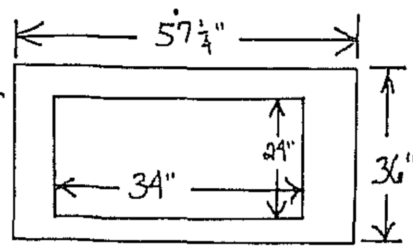


Star-Seal
#410-S
Gasket

RISER SECTIONS/CONVERSION LIDS

6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					

8" Thick Inlet Cap w/ Dap

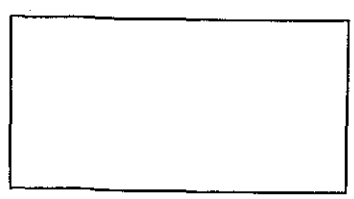


GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION:

26" x 36" Special Frame & Grate
(TYPE 2)



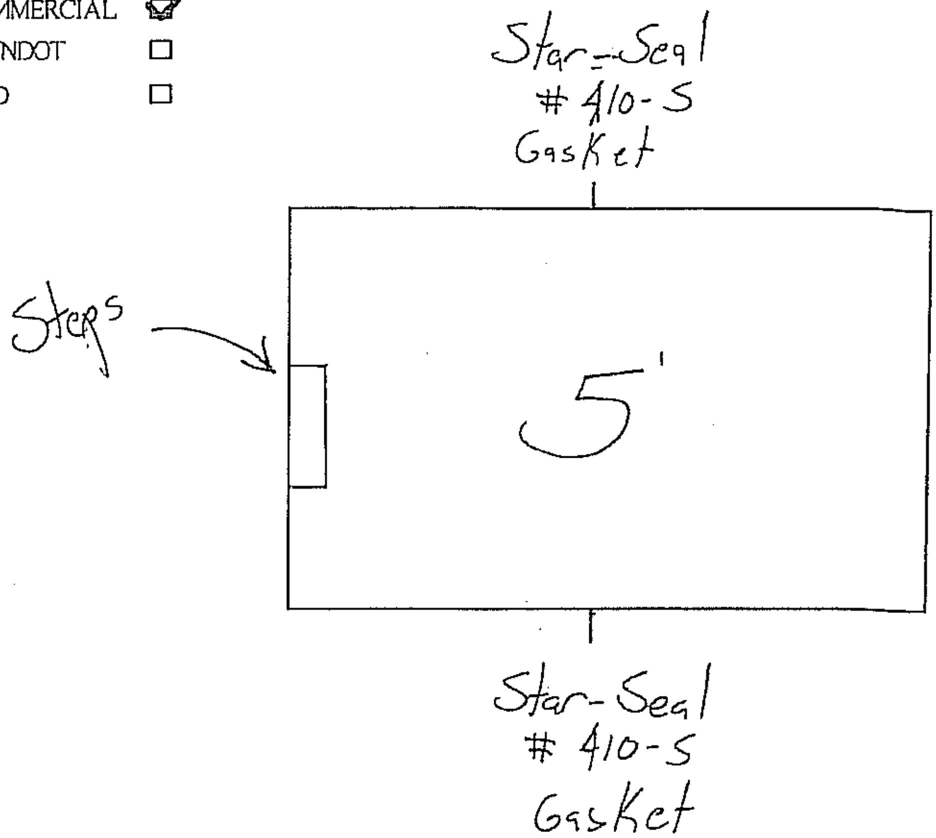
INLET PRODUCTION SHEET

JOB QUOTE: 11-87 STRUCTURE DEPTH 6.97 CUSTOMER Sevenson Environmental

PROD. DATE: ______ BASE HEIGHT: ______ JOB NAME Cornell-Dubilier Superfund Site

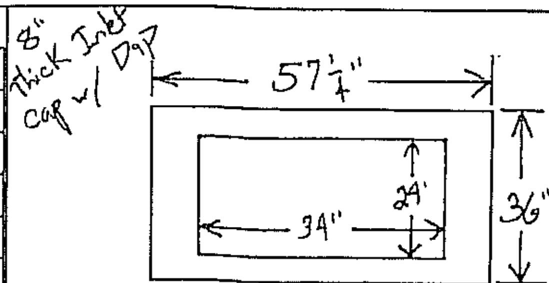
DELIVERY DATE ______ TOP TYPE Sp. F+Gr. STRUCTURE# CB 2

COMMERCIAL ☑
PENNDOT ☐
PWD ☐



RISER SECTIONS/CONVERSION LIDS

6" RISER	X	30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION:

26" x 36" Special Frame & Grate
(TYPE 2)

INLET PRODUCTION SHEET

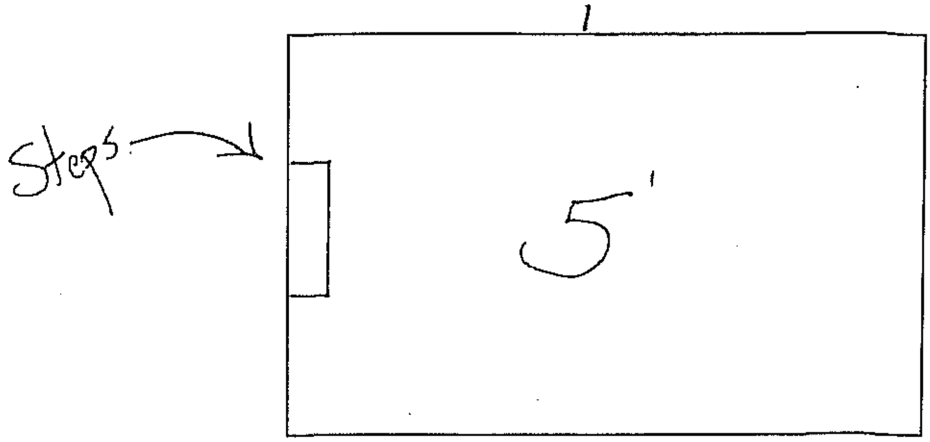
JOB QUOTE: 11-87 STRUCTURE DEPTH: 8.47 CUSTOMER: Sevenson Environmental

PROD. DATE: ______ BASE HEIGHT: ______ JOB NAME: Cornell-Dubilier Superfund Site

DELIVERY DATE: ______ TOP TYPE: Sp. Fr+Gr. STRUCTURE#: C.B 1

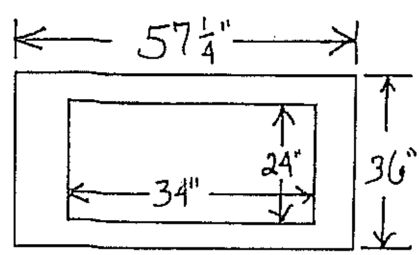
COMMERCIAL ☑
PENNDOT ☐
PWD ☐

Star-Seal
#410-5
Gasket



RISER SECTIONS/CONVERSION LIDS					
6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER	X	48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					

8" Thick Inlet Cap w/ Dap



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION:

26" x 36" Special Frame & Grate
(TYPE 2)

Steps in Riser

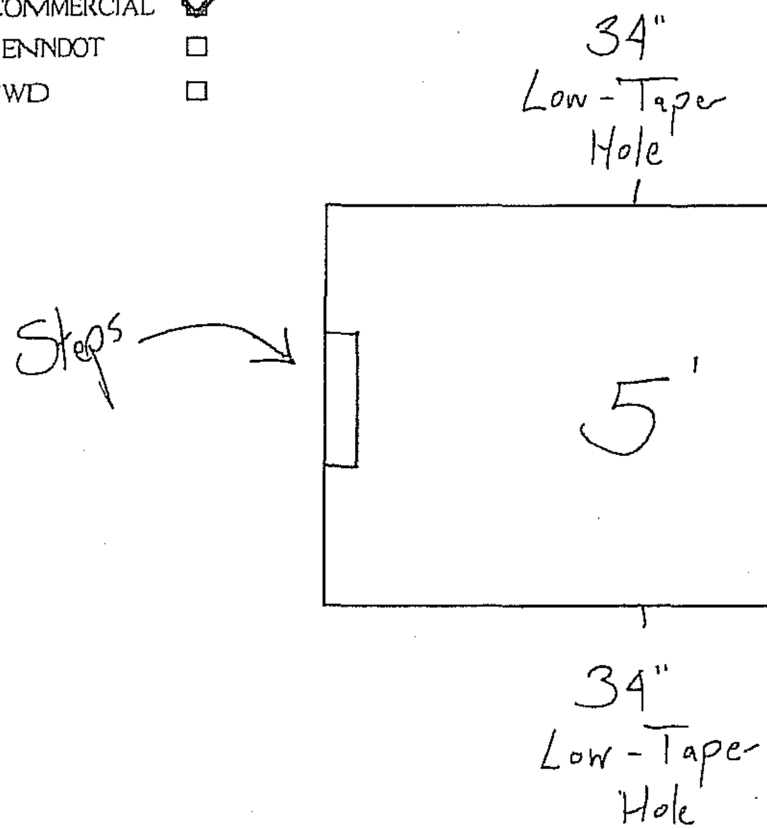
INLET PRODUCTION SHEET

JOB QUOTE: 11-87 STRUCTURE DEPTH 6.80 CUSTOMER Sevenson Environmental

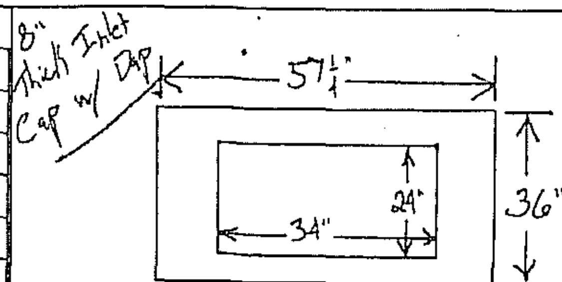
PROD DATE: ______ BASE HEIGHT: ______ JOB NAME Cornell-Dubilier Superfund Site

DELIVERY DATE: ______ TOP TYPE ______ STRUCTURE# CB 22

COMMERCIAL ☑
PENNDOT ☐
PWD ☐



RISER SECTIONS/CONVERSION LIDS					
6" RISER	X	30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 2)

26" x 36" Special Frame & Grate

(2) 34L PSX-2 Boot GasKet

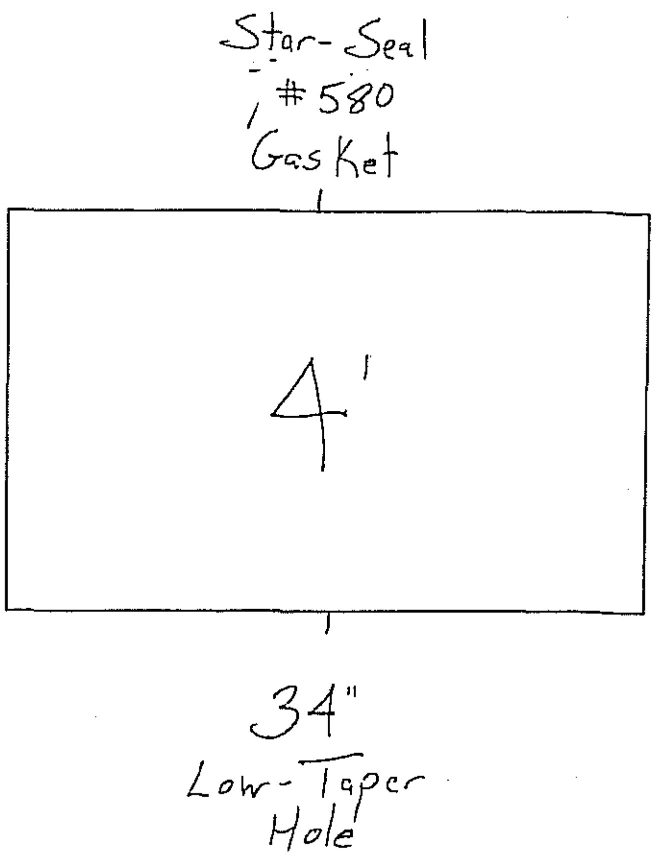
INLET PRODUCTION SHEET

JOB QUOTE: 11-87 STRUCTURE DEPTH 5.25 CUSTOMER Sevenson Environmental

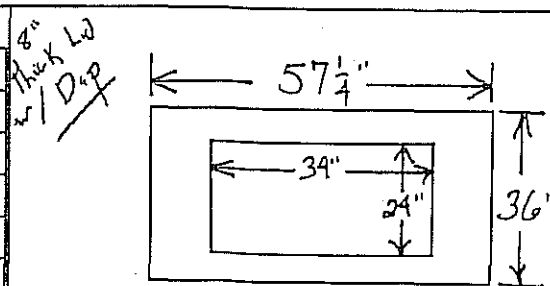
PROD DATE: ______ BASE HEIGHT: ______ JOB NAME Cornell-Dubilier Superfund Site

DELIVERY DATE ______ TOP TYPE Sp. Fr. + Gr. STRUCTURE# CB-21

COMMERCIAL ☑
PENNDOT ☐
PWD ☐



RISER SECTIONS/CONVERSION LIDS					
6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 2)

26" x 36" Special Frame & Grate

34 L PSX-2 Boot Gasket

INLET PRODUCTION SHEET

PAGE 11 OF 24

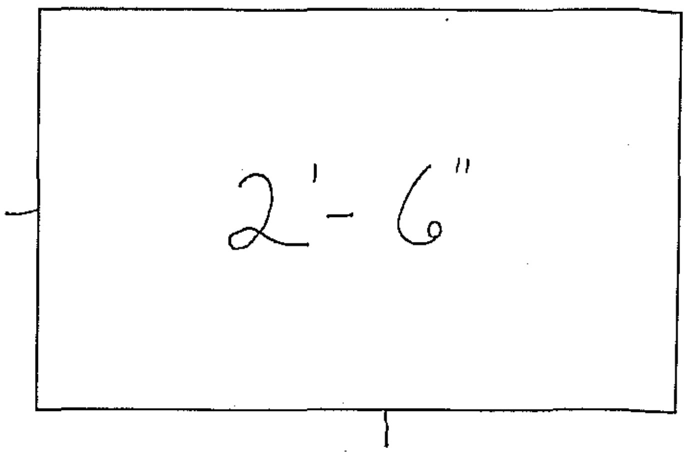
JOB QUOTE# 11-87 STRUCTURE DEPTH 4.01 CUSTOMER Sevenson Environmental

PROD. DATE: ________ BASE HEIGHT: ________ JOB NAME Cornell-Dubilier Superfund Site

DELIVERY DATE: ________ TOP TYPE Sq. Fr. & Gr. STRUCTURE# C.B 20

COMMERCIAL ☑
PENNDOT ☐
PWD ☐

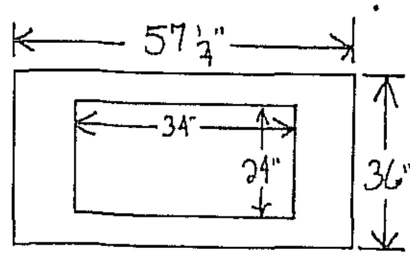
Star-Seal
#410-S
Gas Ket



Star-Seal
#580
Gas Ket

RISER SECTIONS/CONVERSION LIDS					
6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					

4" Thick Cap Inlet w/ Dap



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 2)

26" x 36" Special Frame & Grate

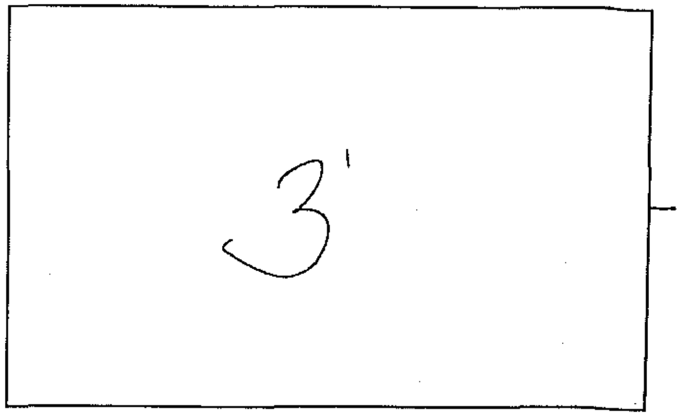
INLET PRODUCTION SHEET

JOB QUOTE: 11-87 STRUCTURE DEPTH 4.41 CUSTOMER Sevenson Environmental

PROD DATE: ______ BASE HEIGHT: ______ JOB NAME Cornell-Dubilier Superfund Site

DELIVERY DATE: ______ TOP TYPE Sp. Fr. & Gr. STRUCTURE# C.B 19

COMMERCIAL ☑
PENNDOT ☐
PWD ☐

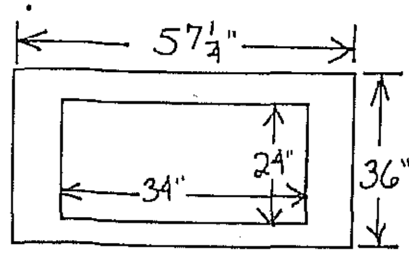


Star-Seal
410-5
Gasket

RISER SECTIONS/CONVERSION LIDS

6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					

8" thick Inlet Cap w/ Opg



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 2)

26" x 36" Special Frame & Grate

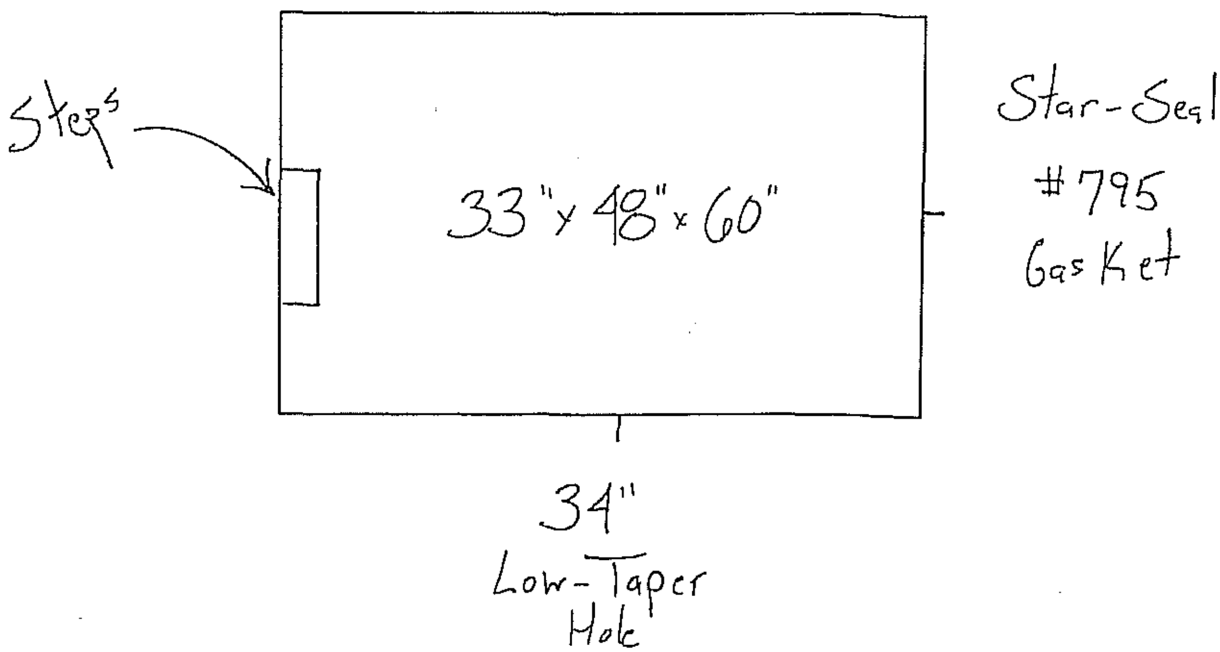
INLET PRODUCTION SHEET

JOB QUOTE# 11-87 STRUCTURE DEPTH 6.92 CUSTOMER Sevenson Environmental

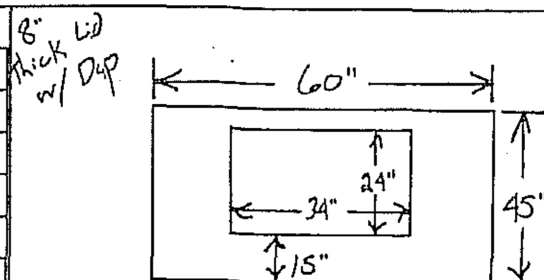
PROD DATE: ______ BASE HEIGHT: ______ JOB NAME Cornell-Dubilier Superfund Site

DELIVERY DATE: ______ TOP TYPE Sp. Fr. & Gr. STRUCTURE# CB 16

COMMERCIAL ☑
PENNDOT ☐
PWD ☐



RISER SECTIONS/CONVERSION LIDS					
6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 1)

26" x 36" Special Frame & Grate
34L PSX-2 Boot Gasket
33x48" x 6" Riser

INLET PRODUCTION SHEET

JOB QUOTE: 11-87 STRUCTURE DEPTH 7.17 CUSTOMER Sevenson Environmental

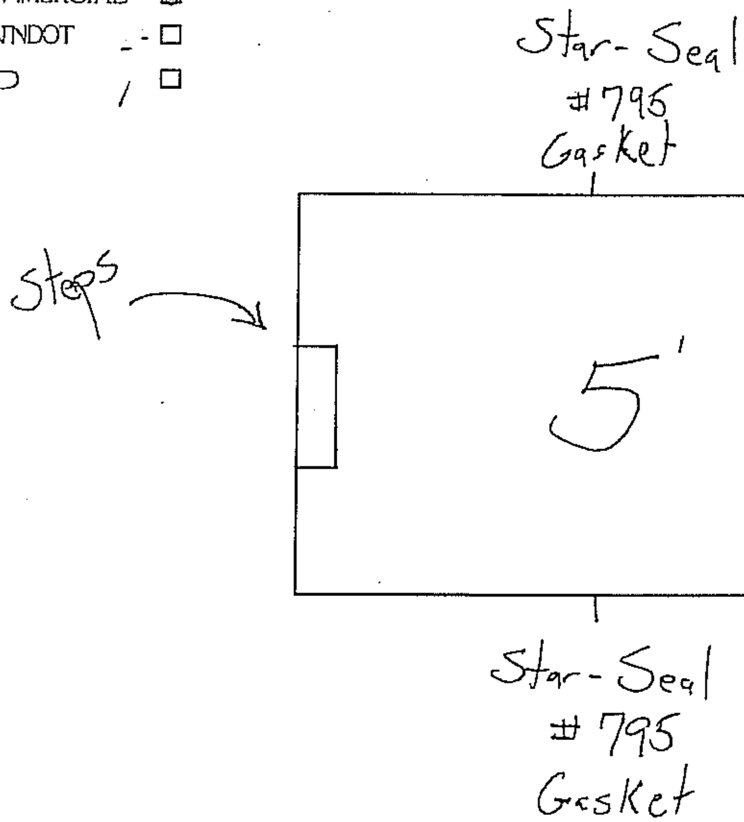
PROD DATE: ________ BASE HEIGHT: ________ JOB NAME Cornell-Dubilier Superfund Site

DELIVERY DATE: ________ TOP TYPE Sp. Fr. + Gr. STRUCTURE# C.B 15

COMMERCIAL ☑

PENNDOT ☐

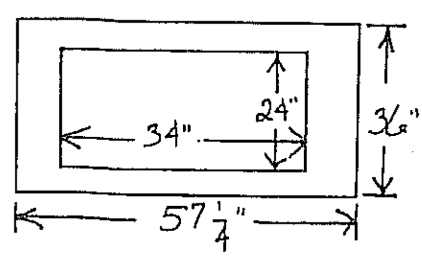
PWD ☐



RISER SECTIONS/CONVERSION LIDS

6" RISER		30" RISER		54" RISER	
12" RISER	X	36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					

4" Thick Cap w/ Dog



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 2)

26" x 36" Special Frame & Grate

Step in Riser

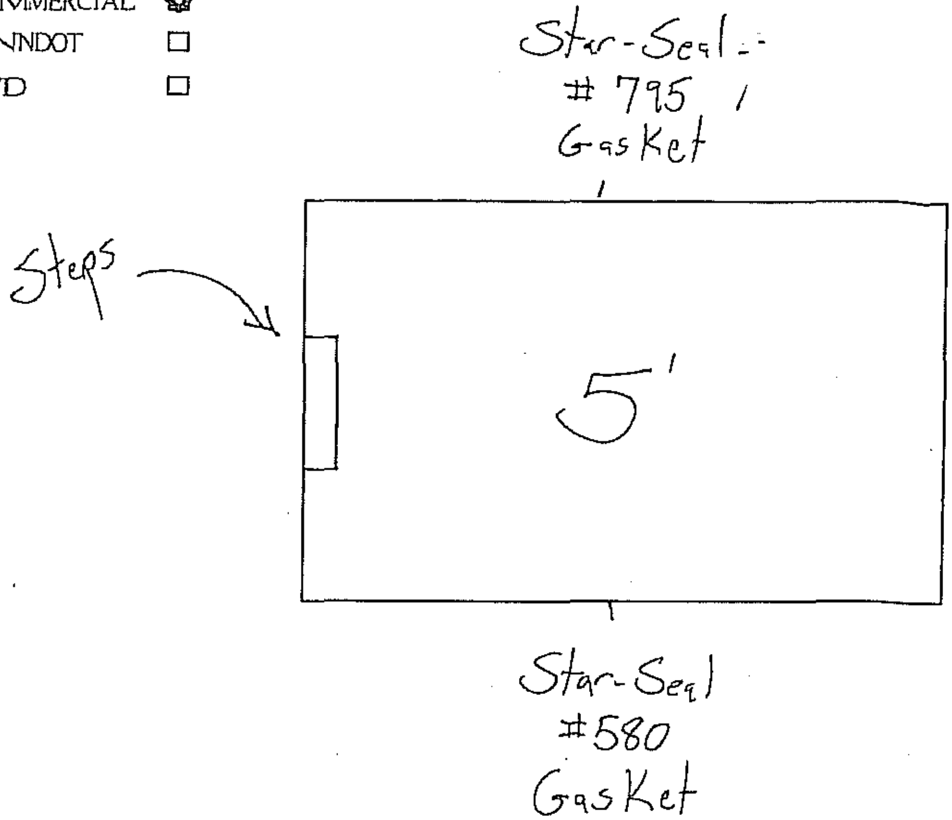
INLET PRODUCTION SHEET

JOB QUOTE 11-87 STRUCTURE DEPTH 7.97 CUSTOMER Sevenson Environmental

PROD DATE: ________ BASE HEIGHT: ________ JOB NAME Cornell-Dubilier Superfund Site

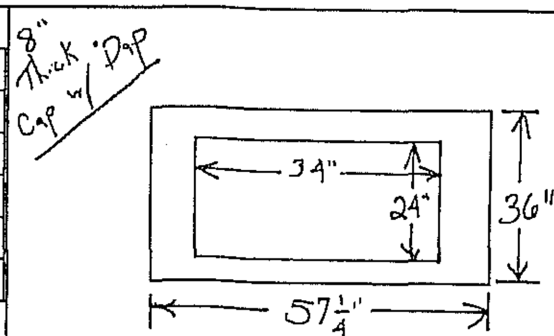
DELIVERY DATE: ________ TOP TYPE Sp. Fr. + Gr. STRUCTURE# C.B 14

COMMERCIAL ☑
PENNDOT ☐
PWD ☐



RISER SECTIONS/CONVERSION LIDS

6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER	X	42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 2)

26" x 36" Special Frame & Grate

Steps in Riser

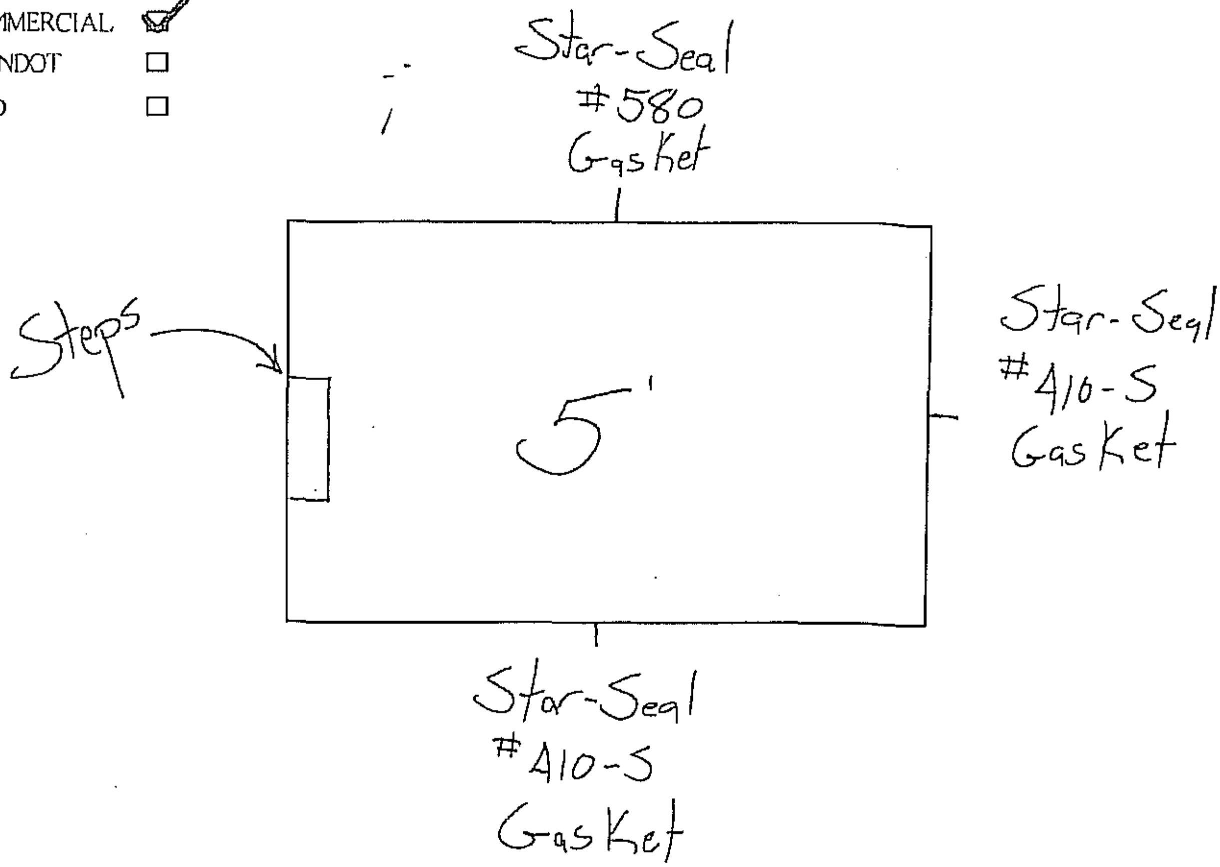
INLET PRODUCTION SHEET

JOB QUOTE# 11-87 STRUCTURE DEPTH 9.47 CUSTOMER Sevenson Environmental

PROD DATE: ______ BASE HEIGHT: ______ JOB NAME Cornell-Dubilier Superfund Site

DELIVERY DATE ______ TOP TYPE Sp. Fr + Gr. STRUCTURE# CB 13

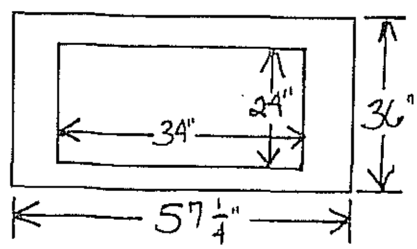
COMMERCIAL ☑
PENNDOT ☐
PWD ☐



RISER SECTIONS/CONVERSION LIDS

6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER	X	60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					

8" Thick Cap w/ Opg



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 2)

26" x 36" Special Frame & Grate

Steps in Riser

INLET PRODUCTION SHEET

JOB QUOTE: 11-87 STRUCTURE DEPTH 3.50 CUSTOMER Sevenson Environmental

PROD. DATE: ______ BASE HEIGHT: ______ JOB NAME Cornell-Dubilier Superfund Site

DELIVERY DATE: ______ TOP TYPE Sp. Fr. + Gr. STRUCTURE# CB 13A

COMMERCIAL ☑
PENNDOT ☐
PWD ☐

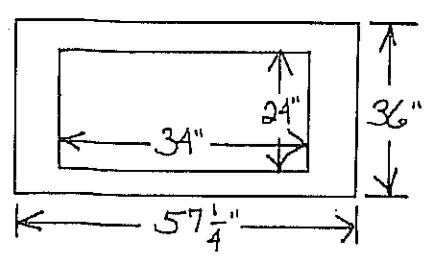
2'

Star-Seal
#410-S
Gasket

RISER SECTIONS/CONVERSION LIDS

6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					

8" Thick Cap w/ Opg



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 2)

26" x 36" Special Frame & Grate

INLET PRODUCTION SHEET

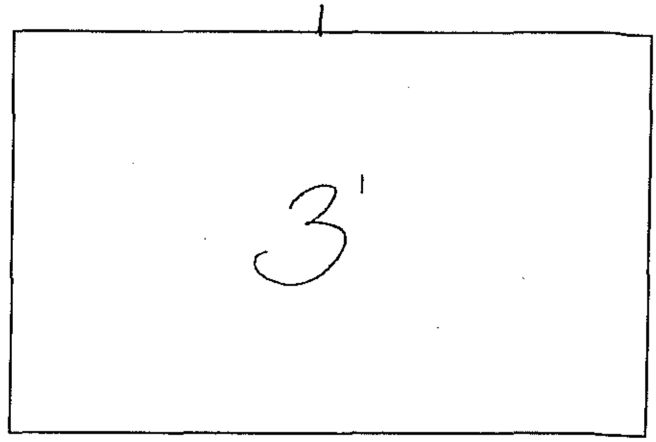
JOB QUOTE: 11-87 STRUCTURE DEPTH 4.17 CUSTOMER Sevenson Environmental

PROD. DATE: ____ BASE HEIGHT: ____ JOB NAME Cornell-Dubilier Superfund Site

DELIVERY DATE: ____ TOP TYPE Sp. Fr. + Gr. STRUCTURE# CB 17

COMMERCIAL ☑
PENNDOT ☐
PWD ☐

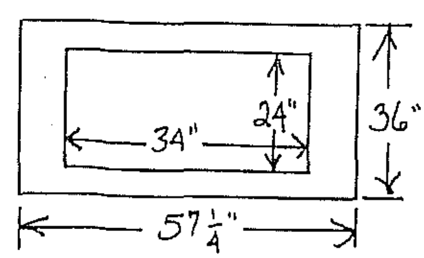
Star-Seal
#410-S
Gasket



RISER SECTIONS/CONVERSION LIDS

6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					

6" Thick Cap & Dap



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 2)

26" x 36" Special Frame & Grate

MANHOLE PRODUCTION SHEET - REV. A 8/25/05

JOB QUOTE# 11-87 STRUCTURE DEPTH 4.90 CUSTOMER: Sevenson Environmental

PROD DATE ________ BASE HEIGHT: ________ JOB NAME: Cornell-Dubilier Superfund Site

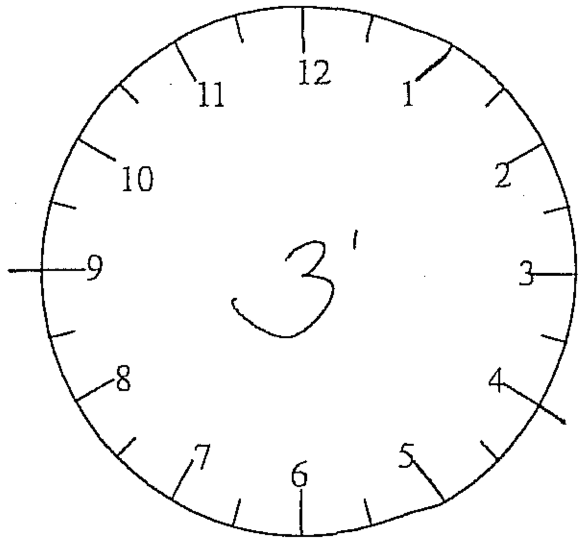
DELIVERY DATE: ________ FLOW CHANNELS YES ☐ NO ☑ STRUCTURE# CB 12

COMMERCIAL ☑

PENNDOT ☐

PWD ☐

Star-Seal
795
Gasket

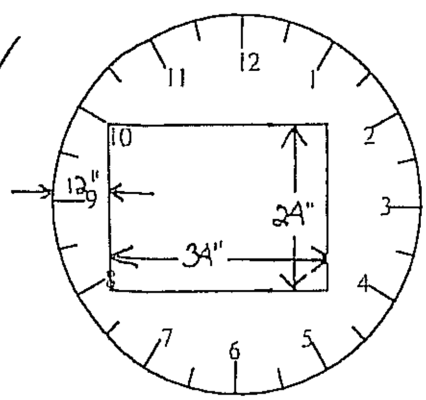


Star-Seal
#580
Gasket

1'-0" MANHOLE RISER [48" DIA]		MH FLAT LID (W/24"o) [48" DIA.]		MH FLAT LID (W/24"o) [60" DIA.]	
2'-0" MANHOLE RISER [48" DIA]		MH FLAT LID (W/30"o) [48"DIA.]		MH FLAT LID (W/30"o) [60" DIA.]	
3'-0" MANHOLE RISER [48" DIA]				1'-0" MANHOLE RISER [72" DIA]	
4'-0" MANHOLE RISER [48" DIA]		2'-0" REDUCER CONE [60"TO48"]		2'-0" MANHOLE RISER [72" DIA]	
2'-0" MH CONE (W/24"o)		1'-0" MANHOLE RISER [60" DIA]		3'-0" MANHOLE RISER [72" ID]	
2'-0" MH CONE (W/30"o)		2'-0" MANHOLE RISER [60" DIA]		4'-0" MANHOLE RISER [72" ID]	
3'-0" MH CONE (W/24"o)		3'-0" MANHOLE RISER [60" DIA]		MH FLAT LID (W/24"o) [72" DIA.]	
3'-0" MH CONE (W/30"o)		4'-0" MANHOLE RISER [60" DIA]		MH FLAT LID (W/30"o) [72" DIA.]	

NO EXTERIOR COATING		EXTERIOR COATING (BLACK)	
EXTERIOR EPOXY (TAN)		INTERIOR EPOXY (WHITE)	
NO MH FRAME & COVER		24" MH F/C "STORM"	
MIJT SEALANT (ROLLS)	|	30" MH F/C STORM	

48" Dia. Flat Lid



M.H. FRAME / COVER

ADDITIONAL INFORMATION:

26" x 36" Special Fr. & Grate
(TYPE 1)

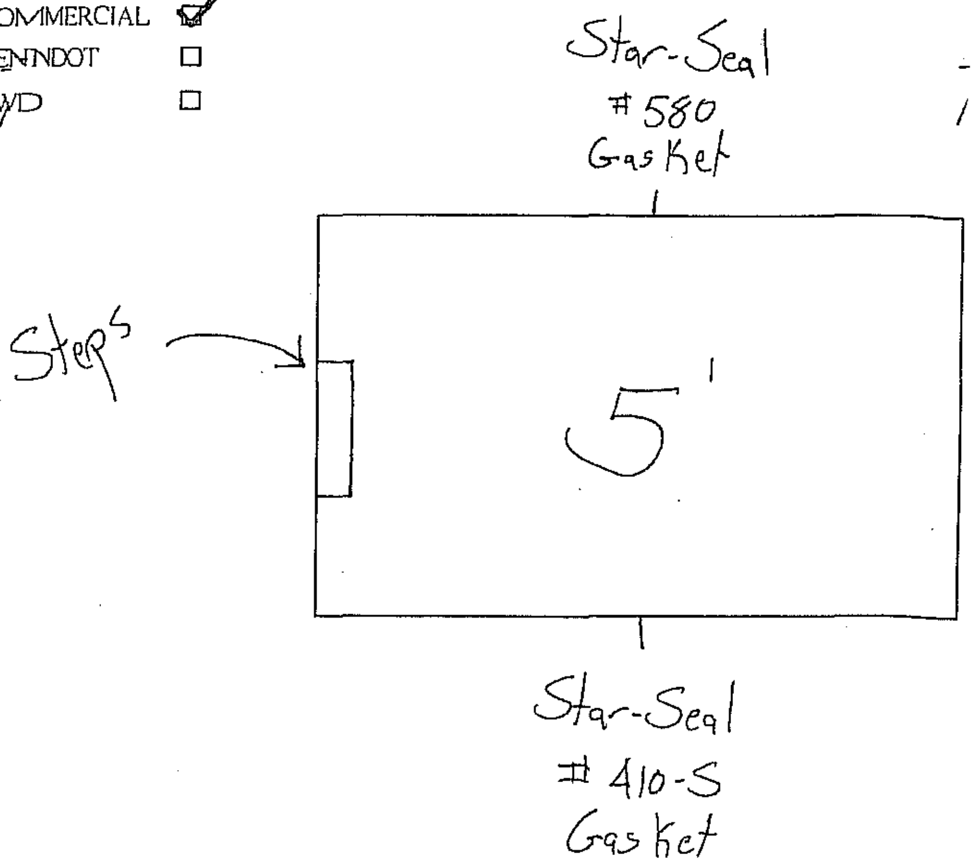
INLET PRODUCTION SHEET

JOB QUOTE# 11-87 STRUCTURE DEPTH 6.50 CUSTOMER Sevenson Environmental

PROD DATE: ________ BASE HEIGHT: ________ JOB NAME Cornell-Dubilier Superfund Site

DELIVERY DATE ________ TOP TYPE Sp. Fr & Gr. STRUCTURE# CB 11

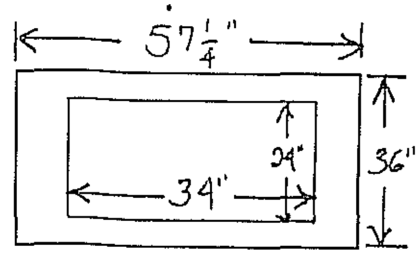
COMMERCIAL ☑
PENNDOT ☐
PWD ☐



RISER SECTIONS/CONVERSION LIDS

6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					

8" thick cap w/ Opening



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 2)

26" x 36" Special Frame & Grate

INLET PRODUCTION SHEET

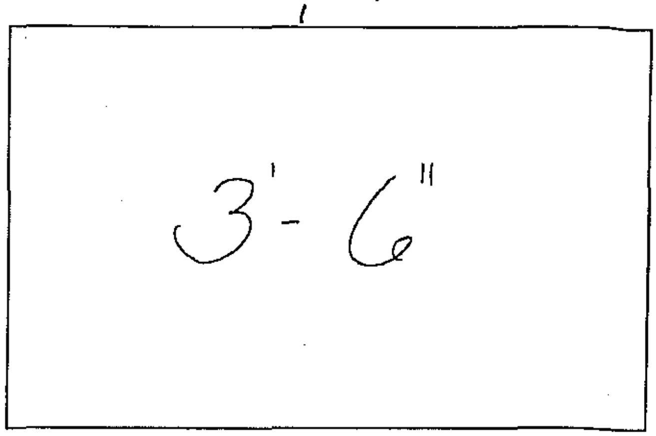
JOB QUOTE: 11-87 STRUCTURE DEPTH 4.80 CUSTOMER Sevenson Environmental

PROD DATE: ______ BASE HEIGHT: ______ JOB NAME Cornell-Dubilier Superfund Site

DELIVERY DATE: ______ TOP TYPE Sp Fr. + Gr. STRUCTURE# CB 10

COMMERCIAL ☑
PENNDOT ☐
PWD ☐

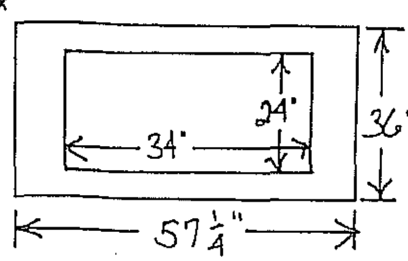
Stac-Seal
#1410-S
Gasket



RISER SECTIONS/CONVERSION LIDS

6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					

8" Thick Cap w/ Dap



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 2)

26" x 36" Special Frame & Grate

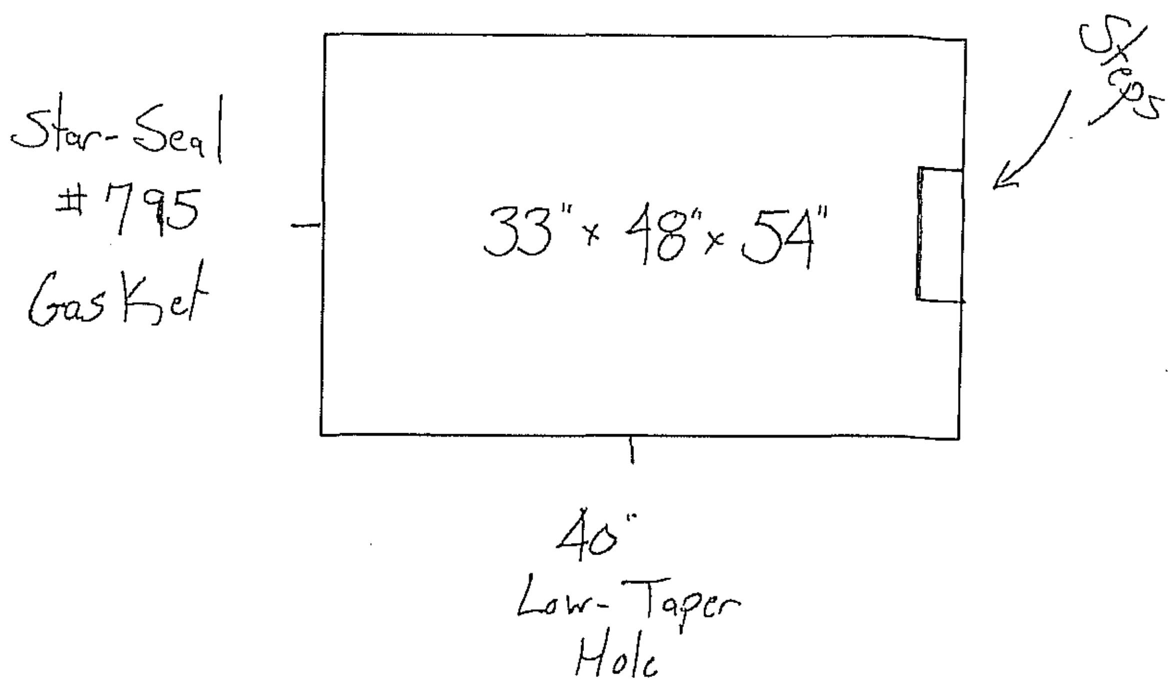
INLET PRODUCTION SHEET

JOB QUOTE# 11-87 STRUCTURE DEPTH 5.82 CUSTOMER Sevenson Environmental

PROD DATE: ______ BASE HEIGHT: ______ JOB NAME Cornell-Dubilier Superfund Site

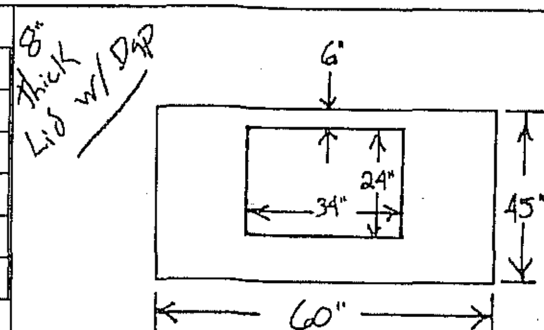
DELIVERY DATE: ______ TOP TYPE Sp. Fr. & Gr. STRUCTURE# CB 8

COMMERCIAL ☑
PENNDOT ☐
PWD ☐



RISER SECTIONS/CONVERSION LIDS

6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 1)

26" x 36" Special Frame & Grate

405 PSX-2 Boot Gasket

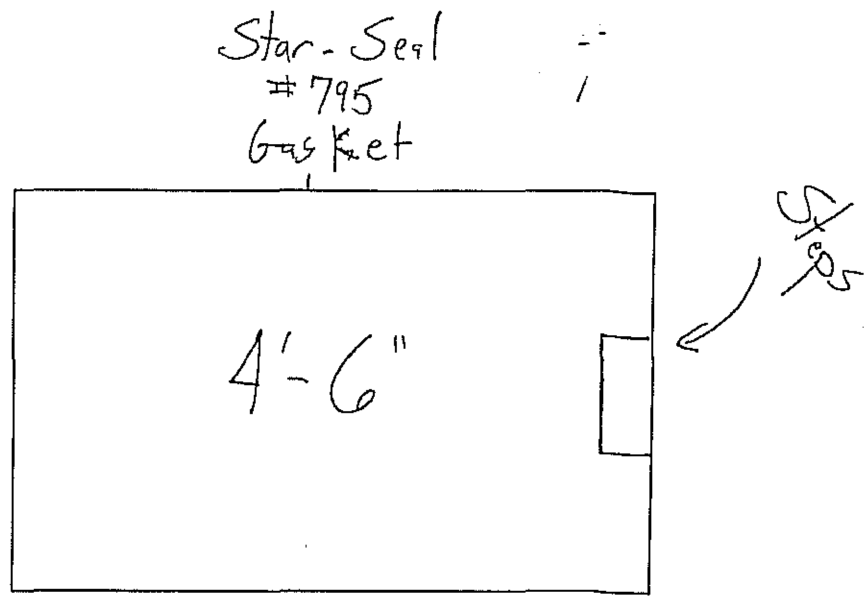
INLET PRODUCTION SHEET

JOB QUOTE# 11-87 STRUCTURE DEPTH 6.00 CUSTOMER Sevenson Environmental

PROD DATE: ______ BASE HEIGHT: ______ JOB NAME Cornell-Dubilier Superfund Site

DELIVERY DATE: ______ TOP TYPE Sp. Fr. & Gr. STRUCTURE# CB 7

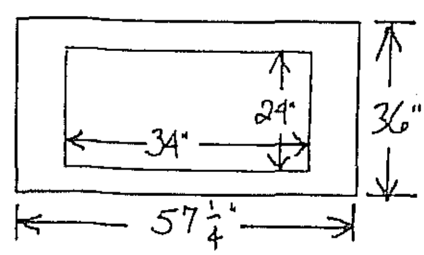
COMMERCIAL ☑
PENNDOT ☐
PWD ☐



RISER SECTIONS/CONVERSION LIDS

6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					

4" Thick Lid w/ Dap



GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 2)

26" x 36" Special Frame & Grate

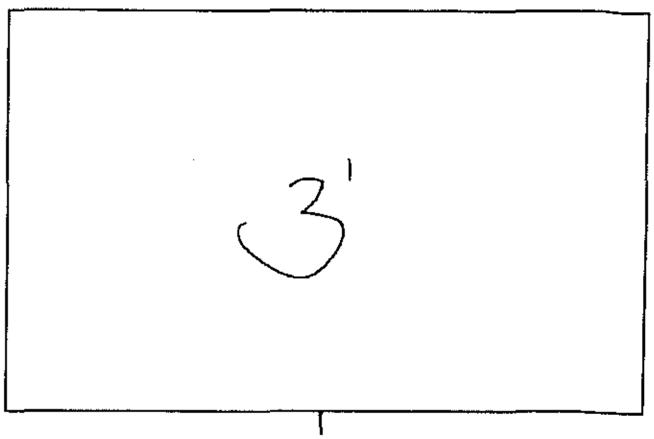
INLET PRODUCTION SHEET

JOB QUOTE: 11-87 STRUCTURE DEPTH 4.50 CUSTOMER Sevenson Environmental

PROD. DATE: ______ BASE HEIGHT: ______ JOB NAME Cornell-Dubilier Superfund Site

DELIVERY DATE: ______ TOP TYPE Sp. Fr. & Gr. STRUCTURE# CB 9

COMMERCIAL ☑
PENNDOT ☐
PWD ☐

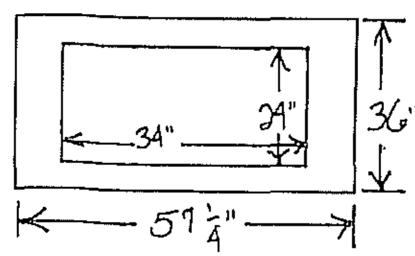


Star-Seal
#580
Gasket

RISER SECTIONS/CONVERSION LIDS

6" RISER		30" RISER		54" RISER	
12" RISER		36" RISER		60" RISER	
18" RISER		42" RISER		33X48 CONV. LID	
24" RISER		48" RISER		4' X 4' CONV. LID	
33X48 W/ ø OPENING					

8" Thick Cap w/ Dip

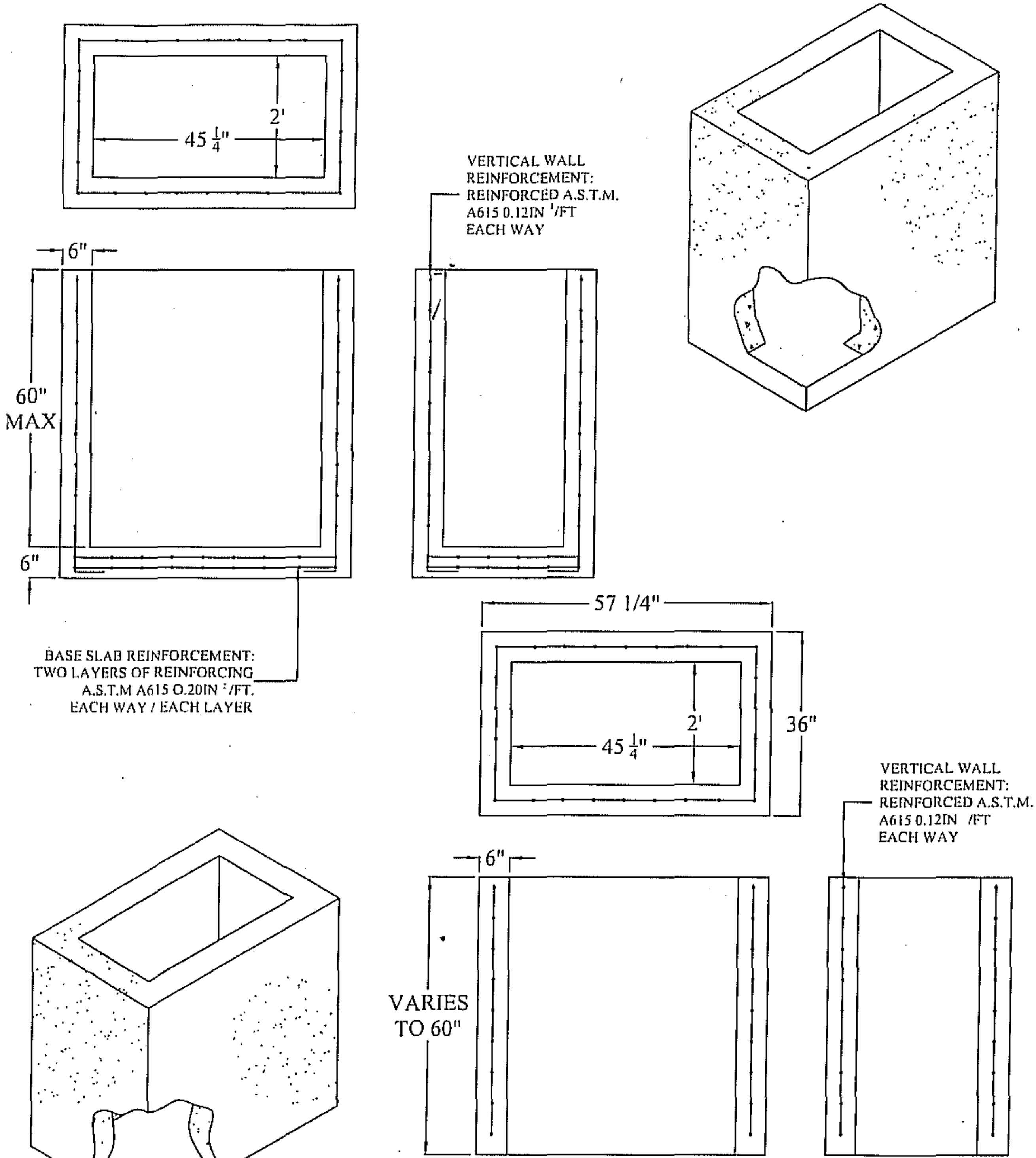


GRATES

H-20 STD		H-20 BIKE		H-25 STD		H-25 BIKE	
PENNDOT VANE GR.		PWD GRATE		6' STD		6' BIKE	
2X2 F/G STD.		2X2 F/G BIKE					

ADDITIONAL INFORMATION: (TYPE 1)

26" x 36" Special Frame & Grate



SPECIFICATIONS

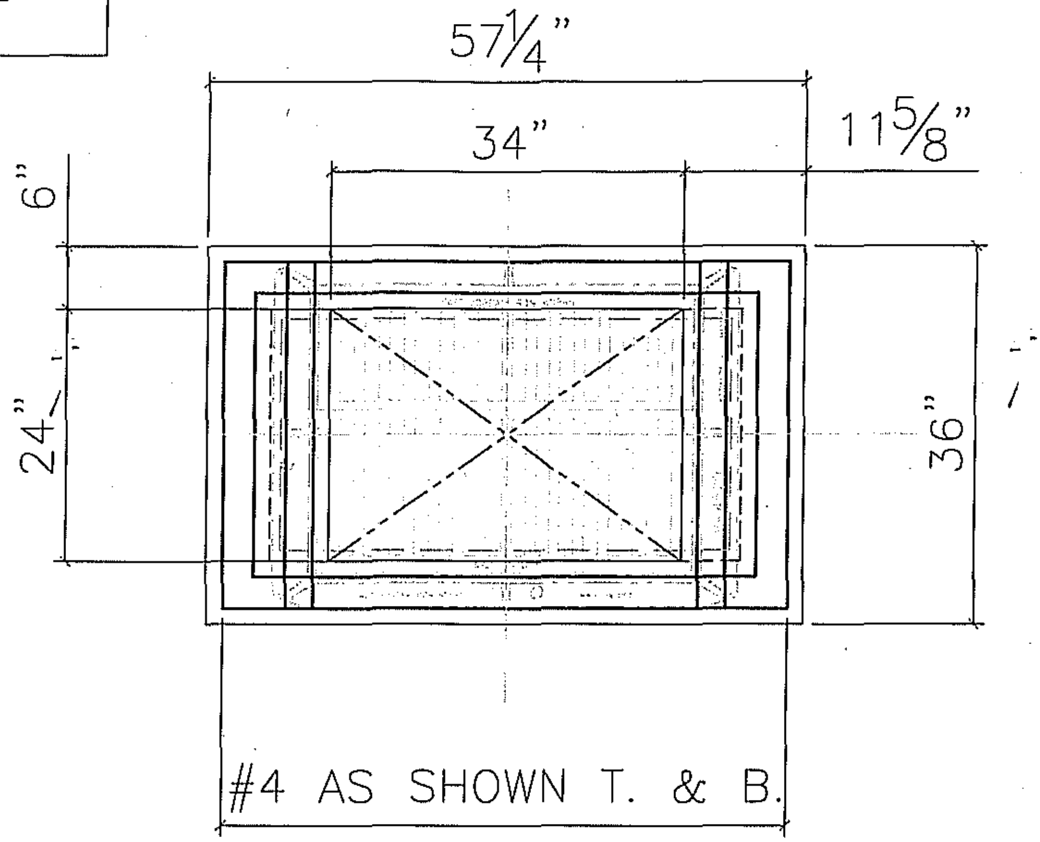
MATERIAL AND CONSTRUCTION SHALL COMPLY WITH PENN D.O.T. PUB 408
PENNDOT CLASS AA CONCRETE 4000 P.S.I. @ 28 DAYS
REINFORCEMENT~ A.S.T.M. A 615 GRADE 60, MIN. 1 1/2" COVER.
LOCATION OF PIPE OPENING AS REQUIRED.
BOXES AND RISERS FABRICATED IN 6" INCREMENTS
MEETS H-25 LOAD REQUIREMENTS

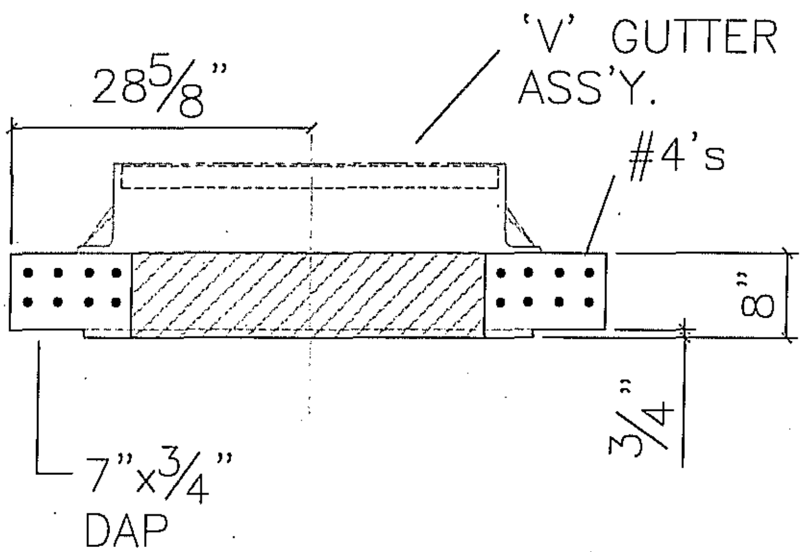
Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

STANDARD 24" x 45 1/4" INLET BOX & RISER SECTION

DATE:	SIGNATURE OF APPROVAL	DWG NO.	NAME:
2-00		ST07	BTH

MAX.SECTION WEIGHT





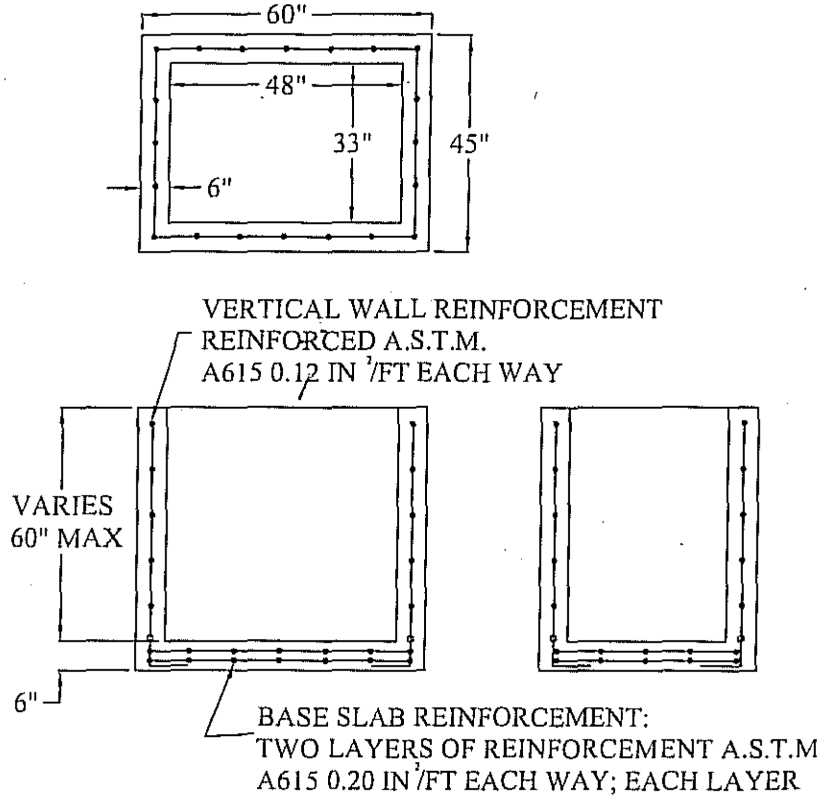
SPECIFICATIONS

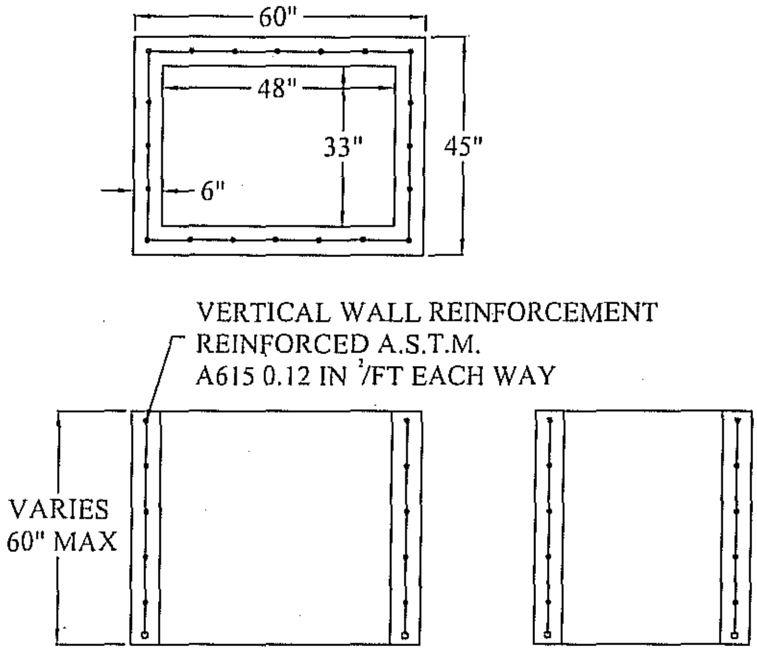
*MATERIAL AND CONSTRUCTION SHALL COMPLY WITH NJ D.O.T.
*NJ DOT CLASS B CONCRETE 4500 P.S.I. @ 28 DAYS
*REINFORCEMENT~ A.S.T.M. A615 GRADE 60, MIN. 1 1/2" COVER U.N.O.

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

CORNELL DUBILIER SUPERFUND SITE
SOUTH PLAINFIELD, N.J.
SEVENSON ENVIREMENTAL SERVICES
2'x4' INLET LID

DATE	RRP	DWG	STRUCTURE
4/11/11		1187-24	MULTI





SPECIFICATIONS

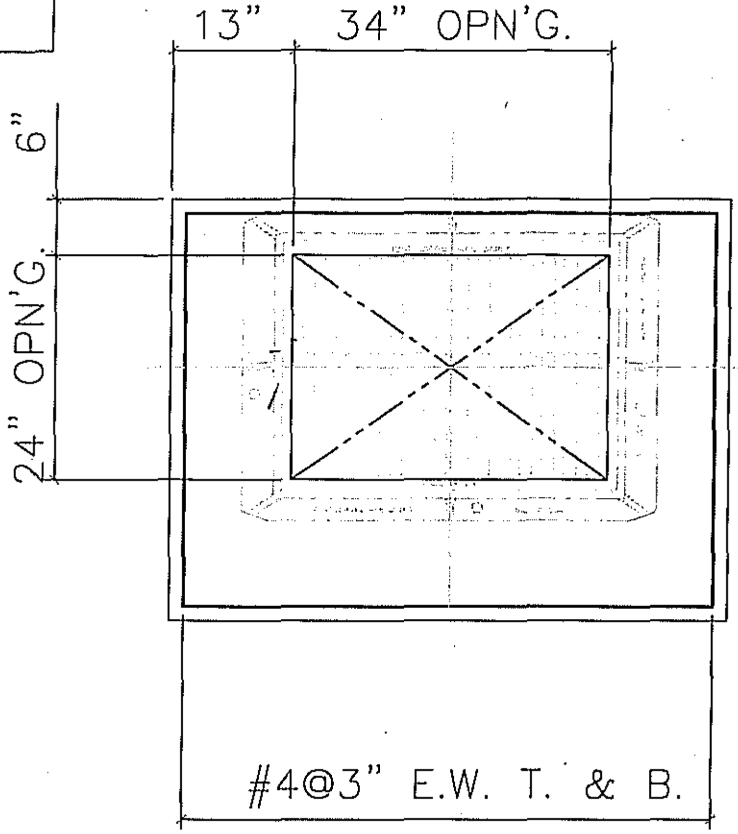
MATERIAL AND CONSTRUCTION SHALL COMPLY WITH PENN D.O.T. PUB. 408
CLASS AA CONCRETE 4000 P.S.I. @ 28 DAYS
REINFORCEMENT~ A.S.T.M. A615 GRADE 60, MIN. 1 1/2" COVER.
LOCATION OF PIPE OPENING AS REQUIRED.
BOXES AND RISER FABRICATED IN 6" INCREMENTS
ADDITIONAL REINFORCEMENT TO BE SUPPLIED FOR COMBINED HEIGHTS OF INLET BOX AND RISER OVER 9'-0"

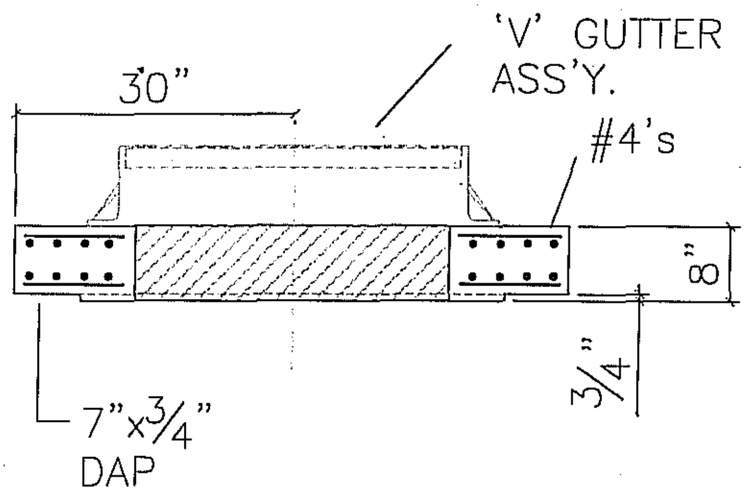
Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

33" X 48" PRECAST INLET BOX AND RISER

DATE:	SIGNATURE OF APPROVAL	DWG NO.	NAME:
6-00		CTLST0028	BTH

MAX.SECTION WEIGHT





SPECIFICATIONS

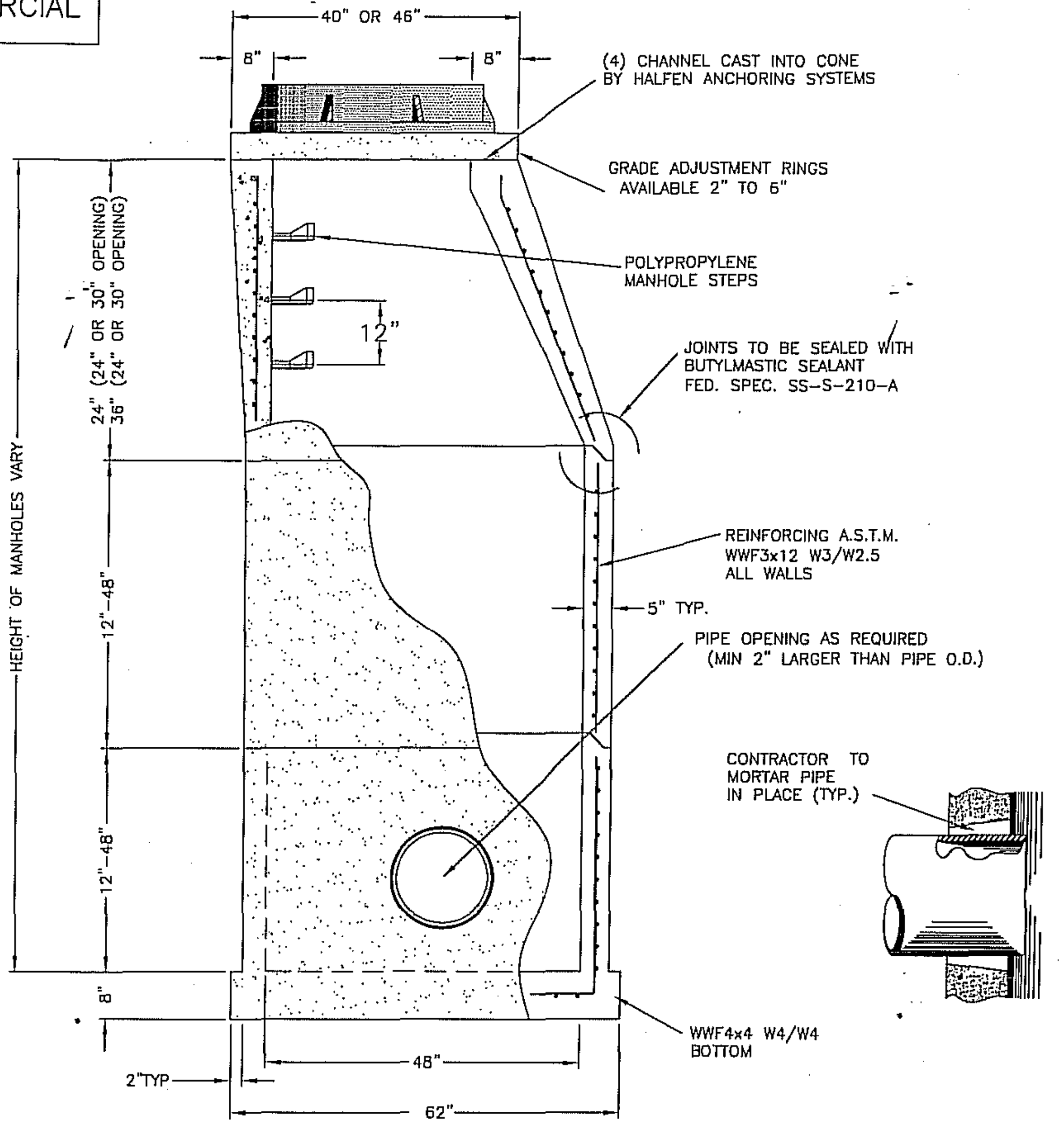
*MATERIAL AND CONSTRUCTION SHALL COMPLY WITH NJ D.O.T.
*NJ DOT CLASS B CONCRETE 4500 P.S.I. @ 28 DAYS
*REINFORCEMENT~ A.S.T.M. A615 GRADE 60, MIN. 1 1/2" COVER U.N.O.

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

CORNELL DUBILIER SUPERFUND SITE
SOUTH PLAINFIELD, N.J.
SEVENSON ENVIREMENTAL SERVICES
33'"x48" INLET LID

DATE	RRP	DWG	STRUCTURE
4/11/11		1187-816	8,16

COMMERCIAL



SPECIFICATIONS

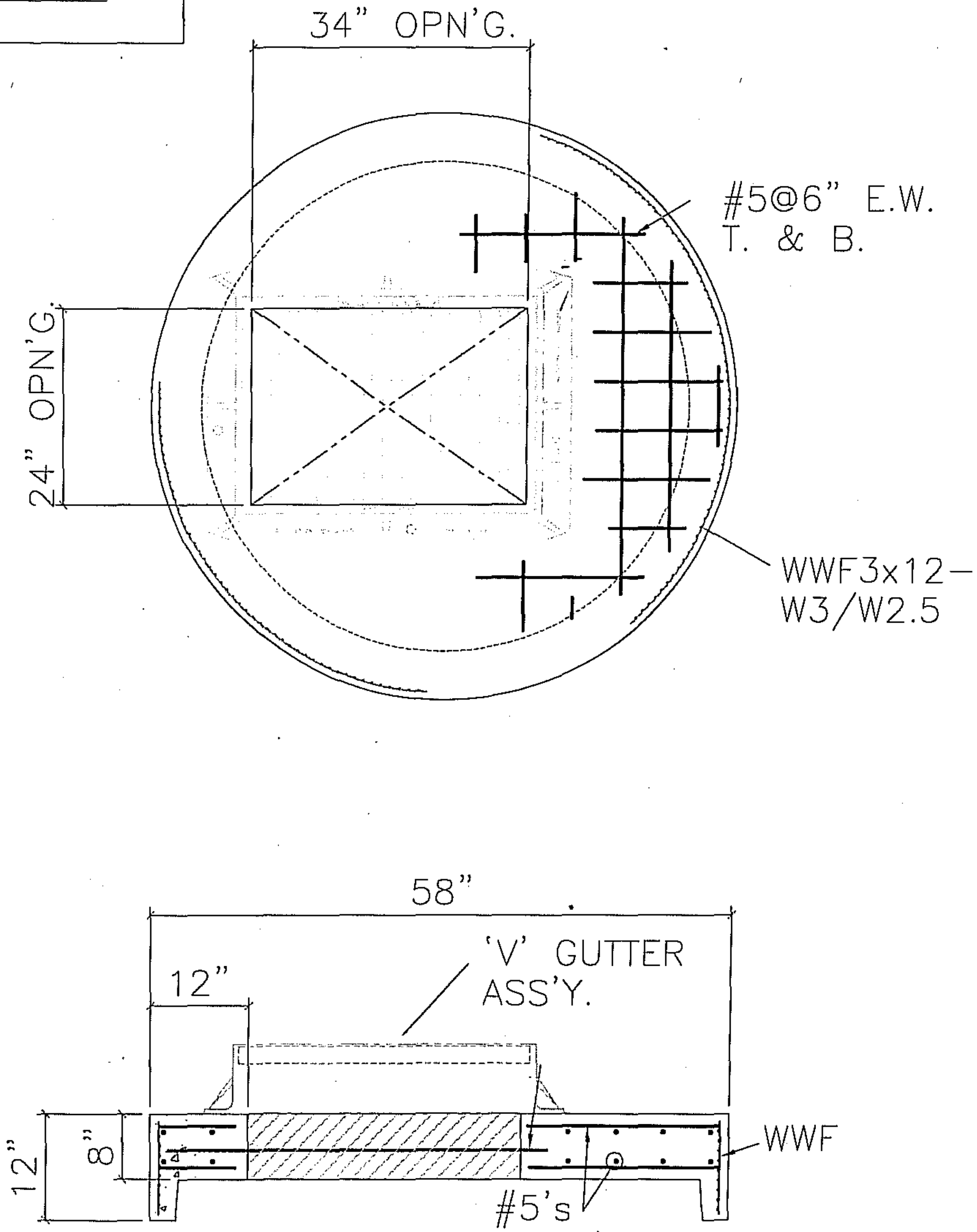
MINIMUM CONCRETE STRENGTH 4000 PSI @28 DAYS (PENN DOT CLASS AA)
STEEL REINFORCEMENT –ASTM A185 VERTICAL WALLS STEEL AREA 0.12 IN.^{2}/VERTICAL FOOT.
HORIZONTAL BASE SLAB STEEL AREA 0.13 IN.^{2}/HORIZONTAL FOOT.
1 1/2" MINIMUM CONCRETE COVER (ALL REINFORCEMENT)
MANHOLE DESIGN SPECIFICATIONS CONFORMS TO "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS" ASTM C478, LATEST REVISIONS

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

48" DIA. STORM MANHOLE

SIGNATURE OF APPROVAL	DATE	RRP	DWG	STRUCTURE
	9/23/04		48STMHCOMM	

MAX.SECTION WEIGHT

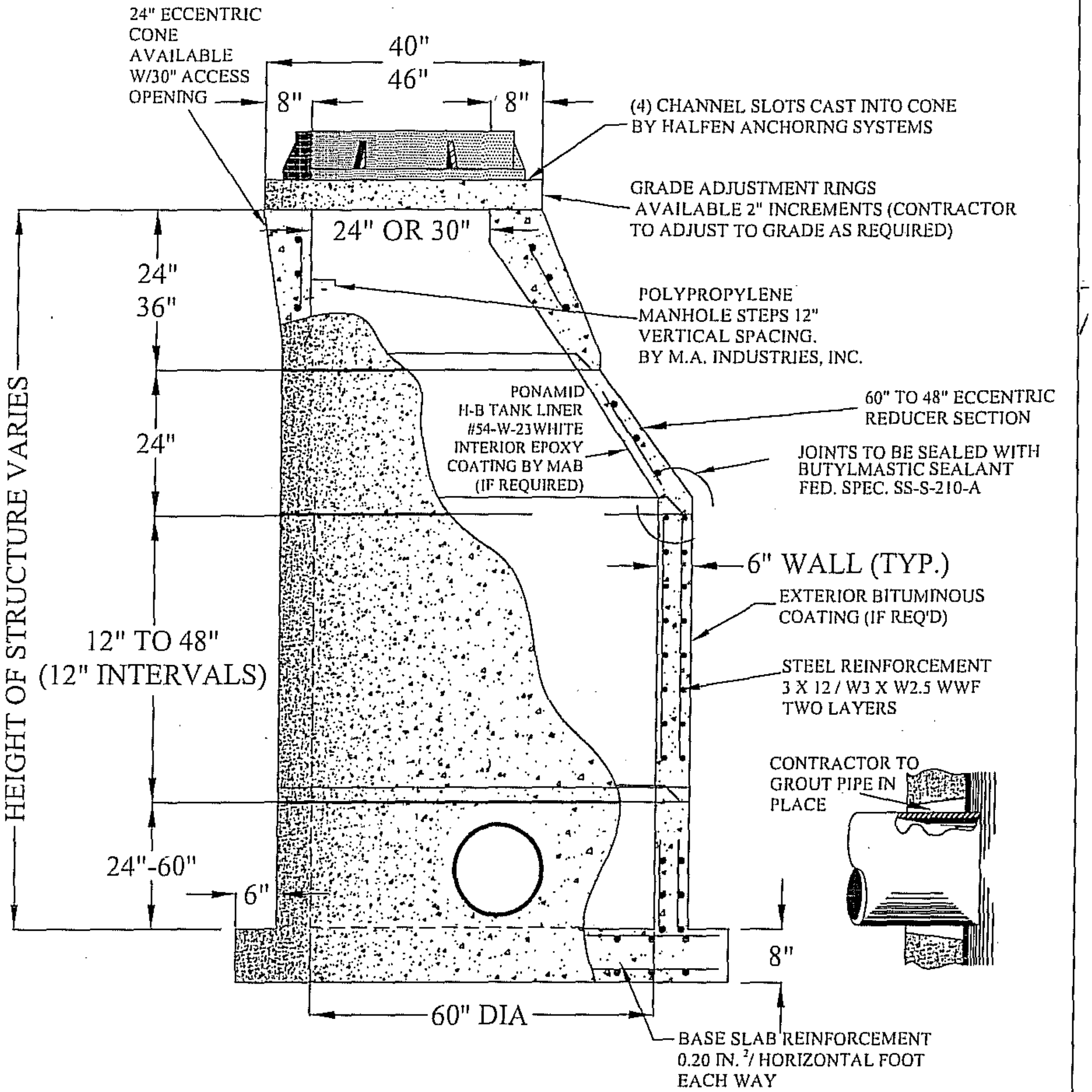


SPECIFICATIONS
*MATERIAL AND CONSTRUCTION SHALL COMPLY WITH NJ D.O.T.
*NJ DOT CLASS B CONCRETE 4500 P.S.I. @ 28 DAYS
*REINFORCEMENT~ A.S.T.M. A615 GRADE 60, MIN. 1 1/2" COVER U.N.O.

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

CORNELL DUBILIER SUPERFUND SITE
SOUTH PLAINFIELD, N.J.
SEVENSON ENVIREMENTAL SERVICES
Ø48" INLET LID

DATE	RRP	DWG	STRUCTURE
4/11/11		1187-4A	4A



<u>SPECIFICATIONS</u>

MINIMUM CONCRETE STRENGTH PENN DOT CLASS AA -4000 PSI @28 DAYS

STEEL REINFORCEMENT -ASTM A185 VERTICAL WALLS STEEL AREA 0.12 IN^2/VERTICAL FT.-(48" DIA.) & 0.15 IN^2/VERTICAL FT. -(60"DIA.)HORIZONTAL BASE SLAB STEEL AREA 0.20 IN^2/HORIZONTAL FT. (1 1/2" MINIMUM CONCRETE COVER)

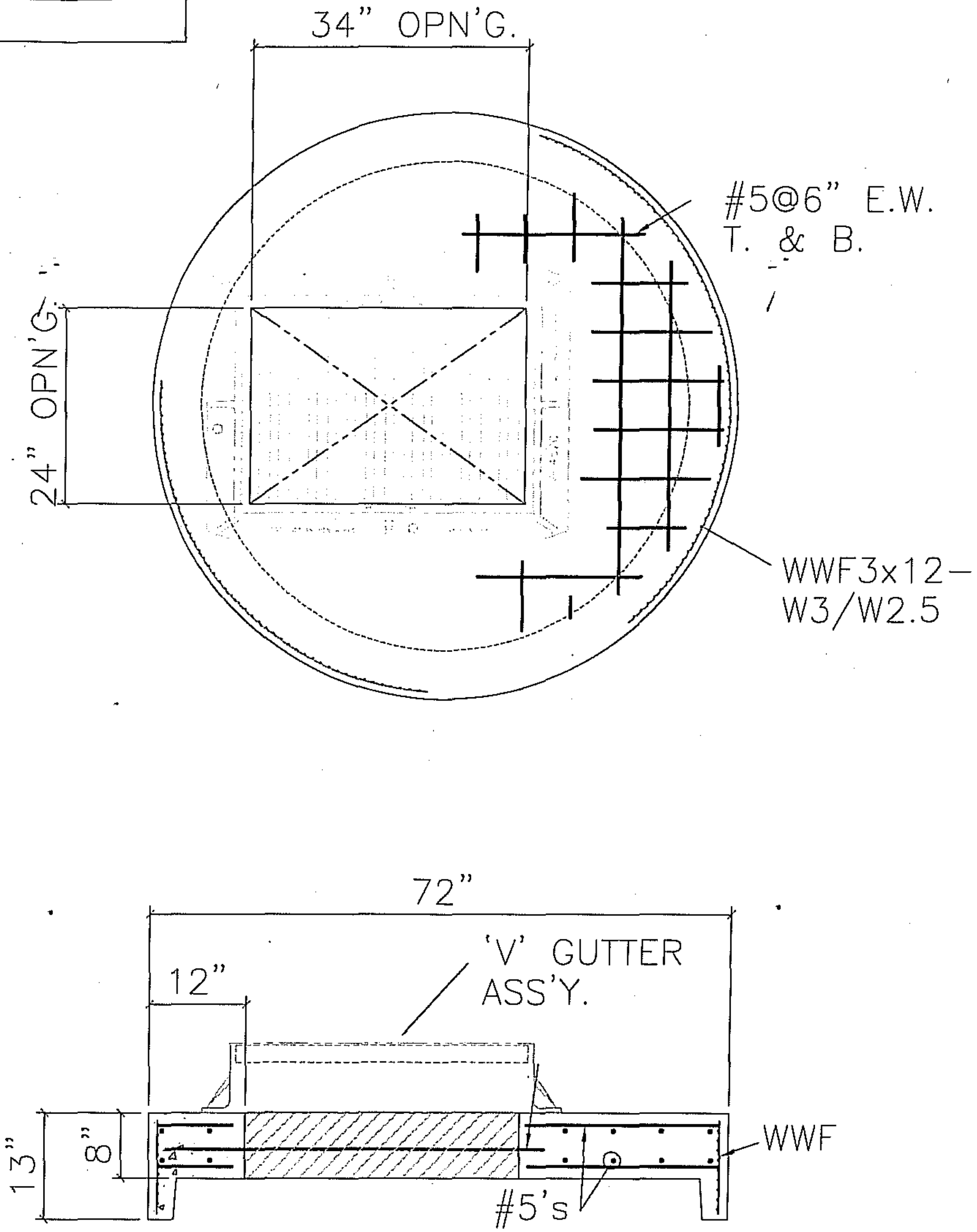
MANHOLE DESIGN SPECIFICATIONS CONFORMS TO "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS" ASTM C478, LATEST REVISIONS

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

60" DIA. STORM MANHOLE w/6" EXT. BASE

DATE:	SIGNATURE OF APPROVAL	DWG NO.	NAME:
2-00		60STMH6X	BTH

MAX.SECTION WEIGHT



SPECIFICATIONS

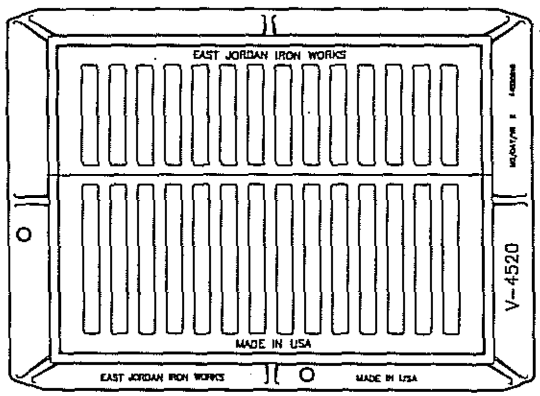
*MATERIAL AND CONSTRUCTION SHALL COMPLY WITH NJ D.O.T.
*NJ DOT CLASS B CONCRETE 4500 P.S.I. @ 28 DAYS
*REINFORCEMENT~ A.S.T.M. A615 GRADE 60, MIN. 1 1/2" COVER U.N.O.

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

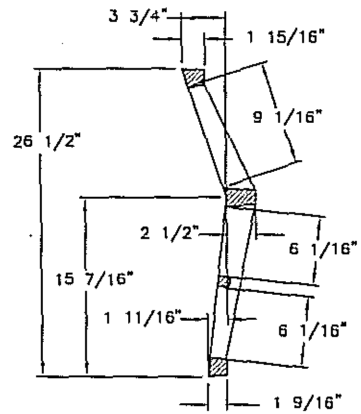
CORNELL DUBILIER SUPERFUND SITE
SOUTH PLAINFIELD, N.J.
SEVENSON ENVIREMENTAL SERVICES
ø60" INLET LID

DATE	RRP	DWG	STRUCTURE
4/11/11		1187–4	4

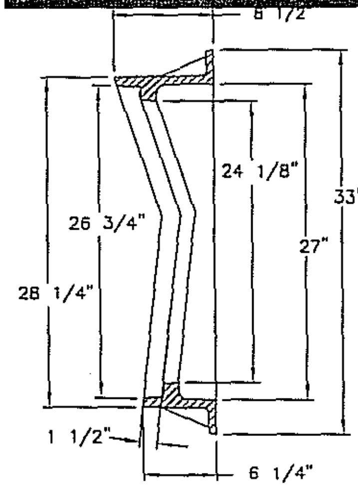
V4520 V4520-1 ASSEMBLY



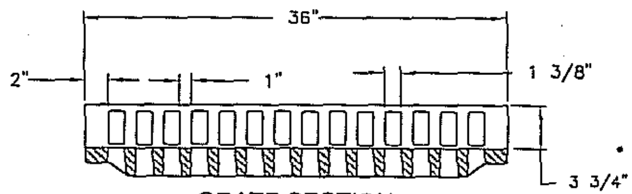
PLAN VIEW



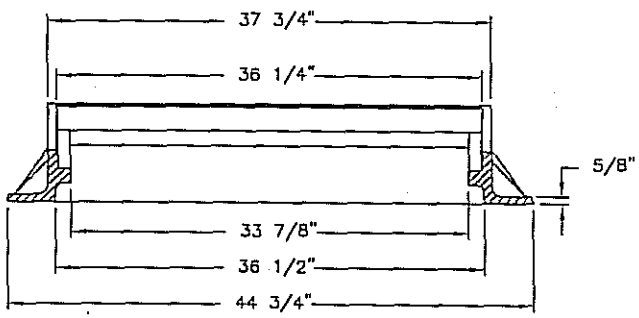
GRATE SECTION



FRAME SECTION



GRATE SECTION



FRAME SECTION

PRODUCT NUMBER

44520001

DESIGN FEATURES

MATERIALS
GRATE-GRAY IRON
ASTM A48 CL35B
FRAME-GRAY IRON
ASTM A48 CL35B

DESIGN LOAD
HEAVY DUTY

COATING
UNDIPPED

OPEN AREA
458 SQ. INCHES

√ DESIGNATES MACHINE SURFACE

REFERENCE INFORMATION

44520130
44520010

DRAWING DETAILS

ORIGINAL DRAWING:	DEW	11/11/03
REVISED BY:	DEW	10/29/10

Corporate
Headquarters
301 Spring Street
PO Box 439
East Jordan, MI
49727-0439
800.874.4100

•Weights (lbs./kg.) dimensions (inches/mm., and drawings provided for your guidance.
•We reserve the right to modify specifications without prior notice.
•Uncontrolled distribution.

11/06/03

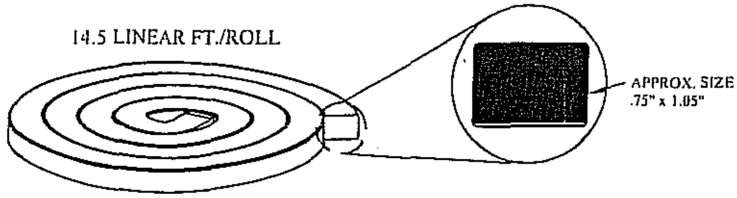
MultiSeal, Inc. Designed Sealant and Adhesive Technologies

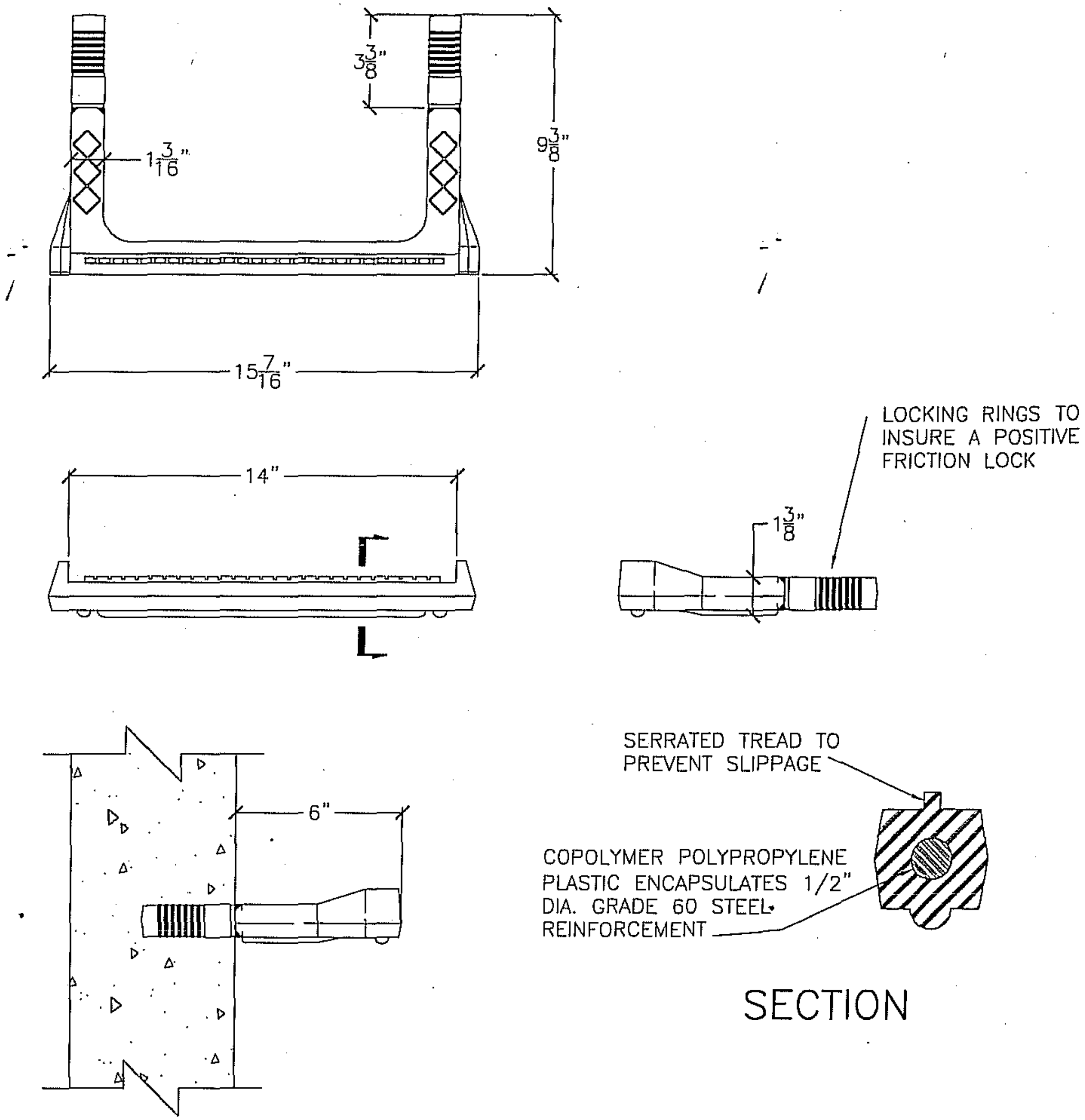
Corporate Office & Mfg. 4320 Hitch and Peters Road Evansville, IN 47711 • Tel. (812) 428-3422 • Fax. (812) 428-3432
R & D / Compounding. 2131 Commercial Ct. Evansville, IN 47720 • Tel. (812) 428-3443 • Fax. (812) 428-3445

TECHNICAL DATA

Product number:	MP1255	
Description	Higher density polymer-based mastic used to seal most clean substrates against moisture, dust, and air. Substrates include concrete, metal, plastic, and other surfaces.	
ASTM C990	Meets ASTM C990 specification for Butyl Rubber Sealant	
	Specification Requirement	**Typical Results**
Butyl Rubber (hydrocarbon blends)	50 % minimum	54 %
Ash-Inert Mineral Matter	30% minimum	44
Volatile Matter	2 % maximum	< 2 %
Specific Gravity at 77°F	1.15 minimum, 1.50 maximum	1.36
Ductility at 77°F, cm	5.0 minimum	8
Flash Point, C.O.C.	350 °F minimum	>500 °F
Fire Point, C.O.C.	375 °F minimum	>500 °F
Rebound Test at 77°F	3 % to 15 %	5.2
at 32°F	3 % to 20 %	5.8
Compression Test at 77°F, lbf/in.^{2}	100 maximum	91
at 32°F, lbf/in.^{2}	200 maximum	128
Low Temperature Flexibility at -10°F	180° bend, no cracking and no loss of adhesion	Pass
Elevated Temperature Flow, 14 days at 158°F	No sag, and no change in extruded shape	Pass
Adhesion after impact	No greater loss than 50 % of adhesion	Pass
Cone Penetration at 77°F, dmm	50 to 100	80-95
at 32°F, dmm	40 minimum	50
Chemical Resistance	No deterioration, cracking, or swelling	Pass
Shelf life	Minimum 1 year	

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488





SPECIFICATIONS

PENNDOT BULLETIN 15 APPROVED
MEETS ASTM C478, D4101, A615, & AASHTO M199
MANUFACTURED BY M.A. INDUSTRIES INC. #PS-2PF AND #PS-2B MANHOLE STEP OR EQUAL
SUPERIOR RESISTANCE TO ALL TYPES OF CORROSIVE ENVIRONMENTS FOUND IN SEWERS
RESISTANT TO PULLOUT FORCE OF OVER 1500 POUNDS
DESIGNED TO PREVENT FOOT SLIPPAGE WITH NORMAL USE

Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

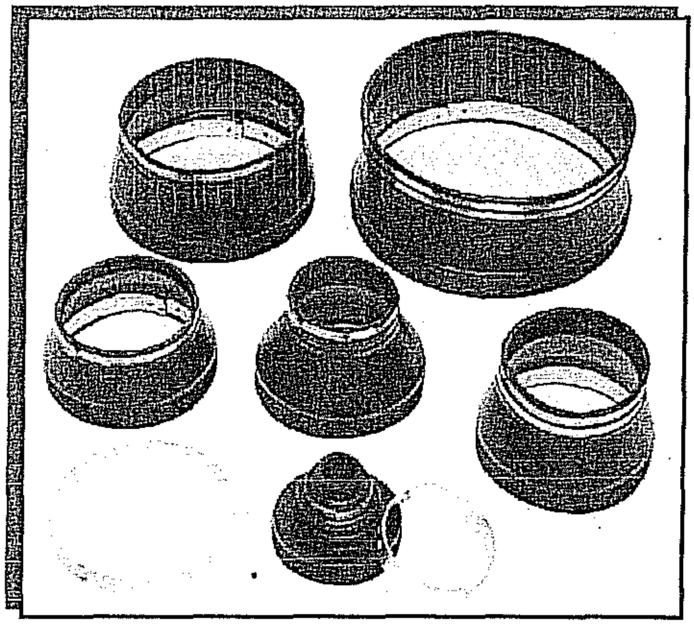
POLYPROPYLENE MANHOLE AND INLET STEPS

SIGNATURE OF APPROVAL	DATE	RRP	DWG	STRUCTURE
	3/27/06		STEPS	

PSX

Providing products and services that protect our planet's clean water supply.

POSITIVE SEAL GASKET SYSTEM WITH POWER SLEEVE EXPANSION



PRESS-SEAL GASKET CORPORATION

P.O. Box 10482, Fort Wayne, Indiana 46852

Phone: (260) 436-0521 (800) 348-7325 Fax: (260) 436-1908 E-mail: sales@press-seal.com Web: www.press-seal.com

PSX

Our original PSX; POSITIVE SEAL pipe-to-manhole flexible connector system. PSX is available for 8" and larger holes to seal the most commonly used pipe types and sizes.

PSX ADVANTAGES

* Meets and/or exceeds Material Specifications of ASTM C-923.
* Type 304 Stainless Steel Compression Power Sleeve is one piece with no welds. Made with 10 and 11 gauge steel.
* Highest installation pressures, 2500 to 6000 PSI. The more PSI force, the better the initial and long term seal.
* Gasket is made of high quality Polyisoprene rubber. Provides greater deflection capabilities and greater tear resistance.
* Type 304 Stainless Steel Take-Up Clamps.
* For use with cored holes, or our fiberglass, or Pro-Former Hole Formers.

TEST	ASTM METHOD	TEST REQUIREMENTS	TEST RESULTS
CHEMICAL RESISTANCE; 1N SULFURIC ACID 1N HYDROCHLORIC ACID	D 534, AT 22°C FOR 48 HRS	NO WEIGHT LOSS NO WEIGHT LOSS	NO WEIGHT LOSS NO WEIGHT LOSS
TENSILE STRENGTH	D 412	1200 PSI, MIN.	2600 PSI
ELONGATION AT BREAK	D 412	350%, MIN.	675%
HARDNESS	D 2240 (SHORE A DUROMETER)	±5 FROM THE MANUFACTURER'S SPECIFIED HARDNESS	45
ACCELERATED OVEN-AGING	D 573, 70± 1°C FOR 7 DAYS	DECREASE OF 15%, MAX. OF ORIGINAL TENSILE STRENGTH, DECREASE OF 20%, MAX. OF ELONGATION	-13% TENSILE CHANGE, -14% ELONGATION CHANGE
COMPRESSION TEST	D 395, METHOD B, AT 70°C FOR 22 HRS	DECREASE OF 25%, MAX. OF ORIGINAL DEFLECTION	13.20%
WATER ABSORPTION	D 471 IMMERSE 0.75 BY 2-IN. SPECIMEN IN DISTILLED WATER AT 70°C FOR 48 HOURS	INCREASE OF 10%, MAX. OR ORIGINAL BY WEIGHT	3.50%
OZONE RESISTANCE	D 1171	RATING 0	PASS
LOW-TEMP, BRITTLE POINT	D 746	NO FRACTURE AT -40°C	PASS
TEAR RESISTANCE	D 624, METHOD B	200 LBF/IN. (MIN.)	318 LBF/IN.

PIPE INSTALLATION

1. Clean pipe and boot to ensure no dirt or foreign materials are present.
2. Clamping surface on pipe must be clean and smooth.
3. Center pipe in opening and insert until pipe breaks the inside plane of manhole.
4. Attach take-up clamp(s) and stagger screw(s) of clamp(s) around the groove of the gasket so that take-up pressure will be equalized. Make sure each clamp is completely in the correct groove.
5. Using a torque ratchet or torque wrench, gradually tighten all screw(s) of clamp(s) in an alternating pattern to 60lbs/in torque.
6. After reaching 60lbs/in torque on final screw, check all screws again to ensure equal compression of all clamps.
7. Vacuum testing shall be conducted in accordance with ASTM C-1244-02.
8. Adjust pipe to line and grade. Use proper bedding, backfill materials and techniques so that pipe deflection and deformation is minimized. Installation of the concrete structure shall be such that differential settlement between the structure and the pipeline shall be less than 10% of pipe diameter for pipes less than 20" and shall be less than 5% of pipe diameter for pipes between 20 and 60 inches in diameter.
9. **Any pipe stubs installed in the manhole must be positively restrained from movement per ASTM C-923. Press-Seal is not responsible for blow outs due to unrestrained pipe stub or future lateral connections.**

Before using the PSX-POSITIVE SEAL system for any custom applications, contact our Customer Service Department for more information.

U.S. Patent No.'s 4215868, 4478437

Press-Seal believes all information is accurate as of its publication date. Information, specifications, and prices are all subject to change without notice. Press-Seal is not responsible for any inadvertent errors.

PRESS-SEAL GASKET CORPORATION

P.O. Box 10482, Fort Wayne, Indiana 46852

Phone: (260) 436-0521 (800) 348-7325 Fax: (260) 436-1908 E-mail: sales@press-seal.com Web: www.press-seal.com

★STAR SEAL★

"RUBBERMAN"

PIPE-TO-MANHOLE SEAL

1. MEETS ASTM 923-C SPECIFICATIONS
2. RUBBER MEETS ASTM 443.
3. 20° OMNI-DIRECTIONAL DEFLECTION.
4. ACCOMMODATES PIPE OD'S FROM 3" AND UP.
5. AS SIMPLE AS LUBRICATING PIPE AND GASKET AND INSERTING PIPE.
6. MAY BE USED IN ROUND OR SQUARE STRUCTURES.
7. ACCOMMODATES SANITARY OR STORM SEWER SITUATIONS.
8. A COMPRESSION SEAL INTEGRALLY CAST INTO THE STRUCTURE.
9. HAS BEEN SUCCESSFULLY USED FOR PIPE ENTRY IN SANITARY SEWERS, STORM SEWERS, SEPTIC TANKS, AND WALLS OF TREATMENT PLANTS.
10. "RUBBERMAN I" LUBRICANT IS SUGGESTED AS AN ENVIRONMENTALLY FRIENDLY PRODUCT TO FACILITATE INSTALLATION PROCEDURES.
11. CAST IN STRUCTURE USING TWO-PIECE STEEL RINGS. ELIMINATING AN "OUT OF ROUNDNESS"SITUATION COMMON WITH FIBERGLASS RINGS.
12. CONSULTATION AVAILABLE CONCERNING ANY ANTI INFILTRATION-EXFILTRATION PROJECT.
13. OVER 40 YEARS EXPERIENCE DESIGNING, TESTING, MARKETING, AND SERVICING SEALS FOR MANUFACTURES OF PIPE, MANHOLES, SEPTIC TANKS, PUMP STATIONS, AND TREATMENT PLANTS.
14. "RUBBERMAN" IS A TRADE NAME FOR O RING, PROFILE GASKETS, PIPE TO MANHOLE SEALS; LUBRICANT, SEALANT, AND THE NEW PRECAST SEWER CHIMNEY AND PIPE ENCASEMENT SYSTEM.

NOTE:

ALL STAR-SEAL™ PIPE-TO-MANHOLE GASKETS ARE
MANUFACTURED BY: HAIL MARY RUBBER CO. INC. WARMINSTER, PA.
DISTRIBTED BY:CONTINENTAL CONCRETE PRODUCTS INC. POSSTOWN, PA.

CCP Continental Concrete Products, Inc.
1 South Grosstown Rd.
Pottstown, PA 19464
Phone: (610) 327-3700
Fax: (610) 327-9488

STAR-SEAL™ COMPRESSION GASKET SPECIFICATION SHEET

DATE:	SIGNITURE OF APPROVAL	DWG NO.	NAME:
6-00		SA12	BTH

PERFORMANCE PIPE
A Division of Chevron Phillips Chemical Company LP

PerformancePipe.com

DRISCOPLEX® 4000 [DIPS] / 4100 [IPS]
HDPE PIPE DATA SHEET

DriscoPlex® 4000/4100 Pipe meets or exceeds:

ASTM F714 (4" and larger) AWWA C906 NSF 61
ASTM D3035 (up to 3") AWWA C901 NSF 61
ASTM D3350, cell classification PE345464C and PE445474C
PPI TR-4 designation PE3608 and PE4710
NSF 14 – Available upon request

DriscoPlex® 4000/4100 Pipe for:

Potable Water, Raw Water, Sanitary Sewer,
Reclaimed Water, Storm Drain, Treated Sewage, etc.
Iron Pipe Size OD (IPS) ¾" to 54",
Ductile Iron Pipe Size OD (DIPS) 4" to 42"
40' and 50' Joints / Solid Black / Color Striping Available
500' coils available in sizes through 6"

NOMINAL PIPE PROPERTIES (1)	UNIT	TEST METHOD	VALUE PE3608	VALUE PE4710
Density	gms / cm^3	ASTM D1505	0.955 (black)	.0960 (black)
Melt Index (MI) Condition 190°C / 2.16kg	gms / 10 minutes	ASTM D1238	0.08	0.08
Hydrostatic Design Basis 73° F (23° C)	psi	ASTM D2837	1600	1600
Hydrostatic Design Basis 140° F (60° C)	psi	ASTM D2837	800	1000
Color: UV Stabilizer [C]	—	ASTM D3350	Min 2% Carbon Black	Min 2% Carbon Black
NOMINAL MATERIAL PROPERTIES (1) (2)	**UNIT**	**TEST METHOD**	**VALUE PE3608**	**VALUE PE4710**
Flexural Modulus 2% Secant – 16:1 span: depth. 0.5 in / min.	psi	ASTM D790	>110,000	>115,000
Tensile Strength at Yield	psi	ASTM D638 Type IV	3200	>3400
Elongation at Break 2 in / min., Type IV Bar	%	ASTM D638	>800	>800
Elastic Modulus	psi	ASTM D638	>150,000	>175,000
Hardness	Shore D	ASTM D2240	62	62
PENT	hrs	ASTM F1473	>100	>500
Vicat Softening Temperature	°F	ASTM D1525	256	256
Brittleness Temperature	°F	ASTM D746	< -103	< -103
Thermal Expansion	in / in / °F	ASTM D696	1.0×10^{-4}	1.0×10^{-4}

1. This is not a product specification and does not guarantee or establish specific minimum or maximum values or manufacturing tolerance for material or piping products to be supplied.
2. Values obtained from tests of specimens taken from piping product may vary from these typical values.

When Performance Matters Rely on *Performance Pipe*

Bulletin: PP101 / August 2009

Performance Pipe, a division of Chevron Phillips Chemical Company LP | 5085 W. Park Blvd | Suite 500 | Plano, TX 75093 | Phone: 800-527-0662 | Fax: 972-599-7348

Lee Supply Co., Inc
Charleroi, PA
1-800-353-3747

PERFORMANCE PIPE
A Division of Chevron Phillips Chemical Company LP

Revised 04-07-2009

IPS Size and Dimension Data

PE4710 (PE3408)

DriscoPlex® Municipal & Industrial & Energy Series/IPS Pipe Data

Pressure Ratings are calculated using 0.63 design factor for HDS at 73°F as listed in PPI TR-4 for PE 4710 materials.
Temperature, Chemical, and Environmental use considerations may require use of additional design factors.

Pressure Rating		→ 125 psi DR 17.0			100 psi DR 21.0			80 psi DR 26.0			63 psi DR 32.5			
IPS Pipe Size	Nominal OD (in)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	Minimum Wall (in)	Average ID (in)	Weight (lbs/ft)	IPS Pipe Size
1 1/4"	1.660													1 1/4"
1 1/2"	1.900													1 1/2"
2"	2.375	0.140	2.078	0.43										2"
3"	3.500	0.206	3.063	0.94										3"
4"	4.500	0.265	3.938	1.55	0.214	4.046	1.27							4"
6"	6.625	0.390	5.798	3.36	0.315	5.957	2.75	0.255	6.084	2.24	0.204	6.193	1.81	6"
8"	8.625	0.507	7.550	5.69	0.411	7.754	4.66	0.332	7.921	3.80	0.265	8.063	3.07	8"
10"	10.750	0.632	9.410	8.83	0.512	9.665	7.24	0.413	9.874	5.91	0.331	10.048	4.77	10"
12"	12.750	0.750	11.160	12.43	0.607	11.463	10.19	0.490	11.711	8.31	0.392	11.919	6.71	12"
14"	14.000	0.824	12.253	14.98	0.667	12.586	12.28	0.538	12.859	10.02	0.431	13.086	8.09	14"
16"	16.000	0.941	14.005	19.57	0.762	14.385	16.04	0.615	14.696	13.09	0.492	14.957	10.56	16"
18"	18.000	1.059	15.755	24.77	0.857	16.183	20.30	0.692	16.533	16.57	0.554	16.826	13.37	18"
20"	20.000	1.176	17.507	30.58	0.952	17.982	25.07	0.769	18.370	20.45	0.615	18.696	16.50	20"
22"	22.000	1.294	19.257	37.00	1.048	19.778	30.33	0.846	20.206	24.75	0.677	20.565	19.97	22"
24"	24.000	1.412	21.007	44.03	1.143	21.577	36.10	0.923	22.043	29.45	0.738	22.435	23.76	24"
26"	26.000	1.529	22.759	51.67	1.238	23.375	42.36	1.000	23.880	34.57	0.800	24.304	27.89	26"
28"	28.000	1.647	24.508	59.93	1.333	25.174	49.13	1.077	25.717	40.09	0.862	26.173	32.34	28"
30"	30.000	1.765	26.258	68.80	1.429	26.971	56.40	1.154	27.554	46.02	0.923	28.043	37.13	30"
32"	32.000	1.882	28.010	78.28	1.524	28.769	64.17	1.231	29.390	52.36	0.985	29.912	42.24	32"
34"	34.000	2.000	29.760	88.37	1.619	30.568	72.44	1.308	31.227	59.11	1.046	31.782	47.69	34"
36"	36.000	2.118	31.510	99.07	1.714	32.366	81.21	1.385	33.064	66.27	1.108	33.651	53.46	36"
42"	42.000	2.471	36.761	134.84	2.000	37.760	110.54	1.615	38.576	90.20	1.292	39.261	72.77	42"
48"	48.000	2.824	42.013	176.12	2.286	43.154	144.38	1.846	44.086	117.81	1.477	44.869	95.05	48"
54"	54.000				2.571	48.549	182.73	2.077	49.597	149.10	1.662	50.477	120.29	54"

Pipe weights are calculated in accordance with PPI TR-7. Average inside diameter is calculated using nomnal OD and Minimum wall plus 6% for use in estimating fluid flows. Actual ID will vary. When designing components to fit the pipe ID, refer to pipe dimension and tolerances in the applicable pipe manufacturing specification.

Series TF-2

- ▶ 100% elastomer construction
- ▶ Will not rust or corrode
- ▶ Will not warp or freeze open or shut
- ▶ Custom-built to customer specifications
- ▶ Low cracking pressure, low headloss
- ▶ Eliminates backflow

Materials of Construction

Neoprene, Hypalon®, Buna-N, EPDM, Viton® and NSF-61-approved SBR.

Mounting Bands

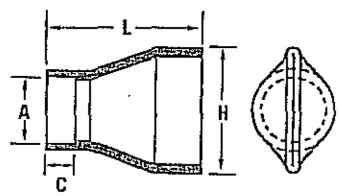
Carbon steel or stainless steel.

Red Valve's Tideflex® Check Valve has a revolutionary design for backflow prevention. It offers low cracking pressure to eliminate standing water and very low headloss that is not affected by rust, corrosion or lack of lubrication. Tideflex® Check Valves are cost-effective because they require no maintenance or repairs and have a long operational life span. Tideflex® operate using line pressure and backpressure to open and close so no outside energy source is required. Sliding, rotating, swinging and plunging parts are completely eliminated.

Tideflex® valves are excellent replacements for ineffective metal flapgate valves. Millions of dollars each year are lost in the re-treatment of unnecessary backflow because of faulty check valves that have corroded open or have been wedged open by debris. Tideflex® Check Valves close drop-tight and seal around debris with less than one psi of backpressure. Tideflex® valves will not warp or freeze and are virtually maintenance free. They will handle large obstructions without jamming, and there is no gate to hang open.

The inside diameter of the TF-2's cuff is constructed to exactly match the outside diameter of the pipe.

The valve is slid onto the pipe and held in place with steel or stainless steel band clamps, eliminating flanging costs. Tideflex® TF-2 valves 18" and larger are constructed with a curved bill as standard.



Pipe O.D. (A)	Length (L)	Bill Height (H)	Cuff Length (C)
3/4	3	1 1/2	1
1	3	1 1/2	1
1 1/2	6	3	1
2	6	4	1
2 1/2	8	5	1
3	9	5 1/2	1 1/2
4	12	7	1 1/2
5	15 1/2	9	2
6	16	10 1/2	2
8	16 1/2	13	2
10	21 1/2	17	3
12	26 1/2	20 1/2	4 1/2
14	26	22	4
16	26	27	5
18	30	29	6
20	33	33	8
22	36	33	8
24	39	37	8

Pipe O.D. (A)	Length (L)	Bill Height (H)	Cuff Length (C)
28	39	37	8
30	42	50	9
32	48	53	10
36	49	61	10
38	49	61	10
40	49	61	10
42	54	71	10
44	54	71	10
48	59	78	10
50	59	78	10
54	69	97	10
58	69	97	10
60	74	97	14
68	74	97	14
72	95	115	16
84	92	111	16
90	101	119	16
92	101	119	16

Tide Technologies
600 N. Bell Ave., Carnegie, PA 15106
Phone: 412.279.0044
Fax: 412.279.7878

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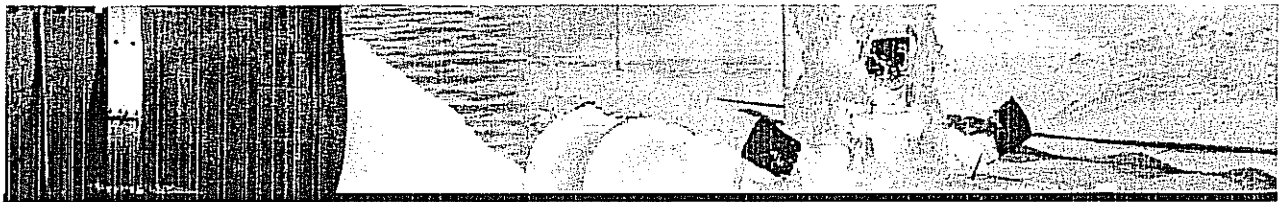

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New CheckMate Inline Check Valve

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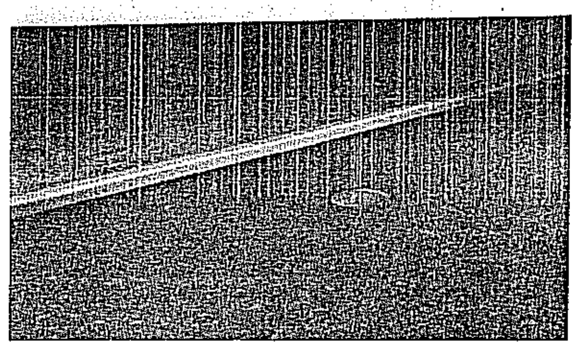
Features

Extremely low headloss
Durable 100% elastomer construction
Easily installed in any type of pipe
No menchanical parts
4" (100 mm) - 72" (1800 mm) size
25 year life expectancy
Operates on differential pressure
Virtually maintenance-free
Self-draining
Less than 1" of head pressure cracks open valve
Eliminates standing water
Silent, non-slamming
Simple installation
Extensive independent hydraulic testing
Opens to near full pipe diameter



Materials Of Construction

Elastomer Information
Expansion Clamps:
304 Stainless Steel (Standard)
316 Stainless Steel
Special Alloys Available

To view the CheckMate® Valve in action, press the play button above.

Description

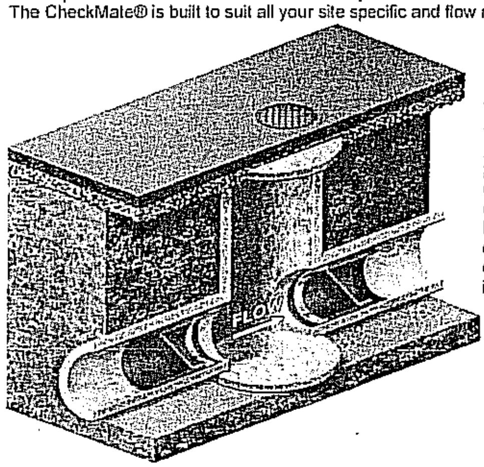
Patented by Red Valve Company, the CheckMate® Inline Check Valve is ideal for backflow prevention and odor mitigation. In outfalls, stormwater, CSO and SSO applications, the CheckMate's® custom-engineered, all-rubber unibody design eliminates costly backflow from oceans, rivers and interceptors. CheckMate® Valves are readily available in 4" to 72" sizes. The CheckMate® is built to suit all your site specific and flow needs.

Brochures

- *CheckMate® Inline Check Valve*

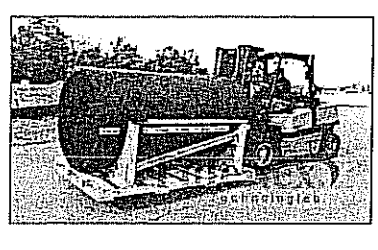
Case Studies

Stormwater Flood Protection
Odor Mitigation



30"
CB-6 TO POND

The CheckMate's® unique elastomer-reinforced design provides a proven record of maintenance-free performance, cost savings and results that no other inline check valve can match. The valve has a 100% fabric and elastomer construction that eliminates corrosion problems. Because the CheckMate® is made with a unibody construction, there are no mechanical components to catch debris, corrode or fail. The result is in savings - both in time and costs.



PURE GUM RUBBER (PGR)

Excellent resiliency, tensile strength, and abrasion resistance. Generally good for most weak chemicals, wet or dry organic acids, sodium hydroxide (caustic), alcohols and ketones.
Affected By: Ozone, strong acids, fats, oils, greases, wet chlorine gas, methane and most hydrocarbons.
Operating Temperature Range: -50° F to +180° F

NEOPRENE

Generally resistant to moderate chemicals, ozone, fats, sodium hydroxide (caustic), methane and most hydrocarbons.
Affected By: Strong oxidizing acids, acetic acid, ketones, wet chlorine gas, chlorinated and nitro-hydrocarbons, and aromatic hydrocarbons.
Operating Temperature Range: -50° F to +230° F

WHITE FOOD GRADE NEOPRENE

Generally resistant to moderate chemicals, ozone, fats, sodium hydroxide (caustic), methane and most hydrocarbons.
Affected By: Strong oxidizing acids, acetic acid, ketones, wet chlorine gas, chlorinated and nitro-hydrocarbons, and aromatic hydrocarbons.
Operating Temperature Range: -50° F to +230° F

EPDM (NORDEL)

Excellent abrasion and chemical resistance at elevated temperatures. Good with dilute acids (sulfuric & acetic), steam, ketones, sodium hydroxide (caustic), hydrogen sulfide and domestic wastewater. Good UV resistance. Also used with radioactive wastewaters.
Affected By: Petroleum oils, hydrochloric acid, concentrated methane, wet chlorine gas.
Operating Temperature Range: -50° F to +300° F

WHITE FOOD GRADE EPDM (NORDEL)

Excellent abrasion and chemical resistance at elevated temperatures. Good with dilute acids, (sulfuric & acetic), steam, ketones, sodium hydroxide (caustic), hydrogen sulfide and domestic wastewater. Good UV resistance. Also used with radioactive wastewaters.
Affected By: Petroleum oils, hydrochloric acid, concentrated methane, wet chlorine gas.
Operating Temperature Range: -50° F to +300° F

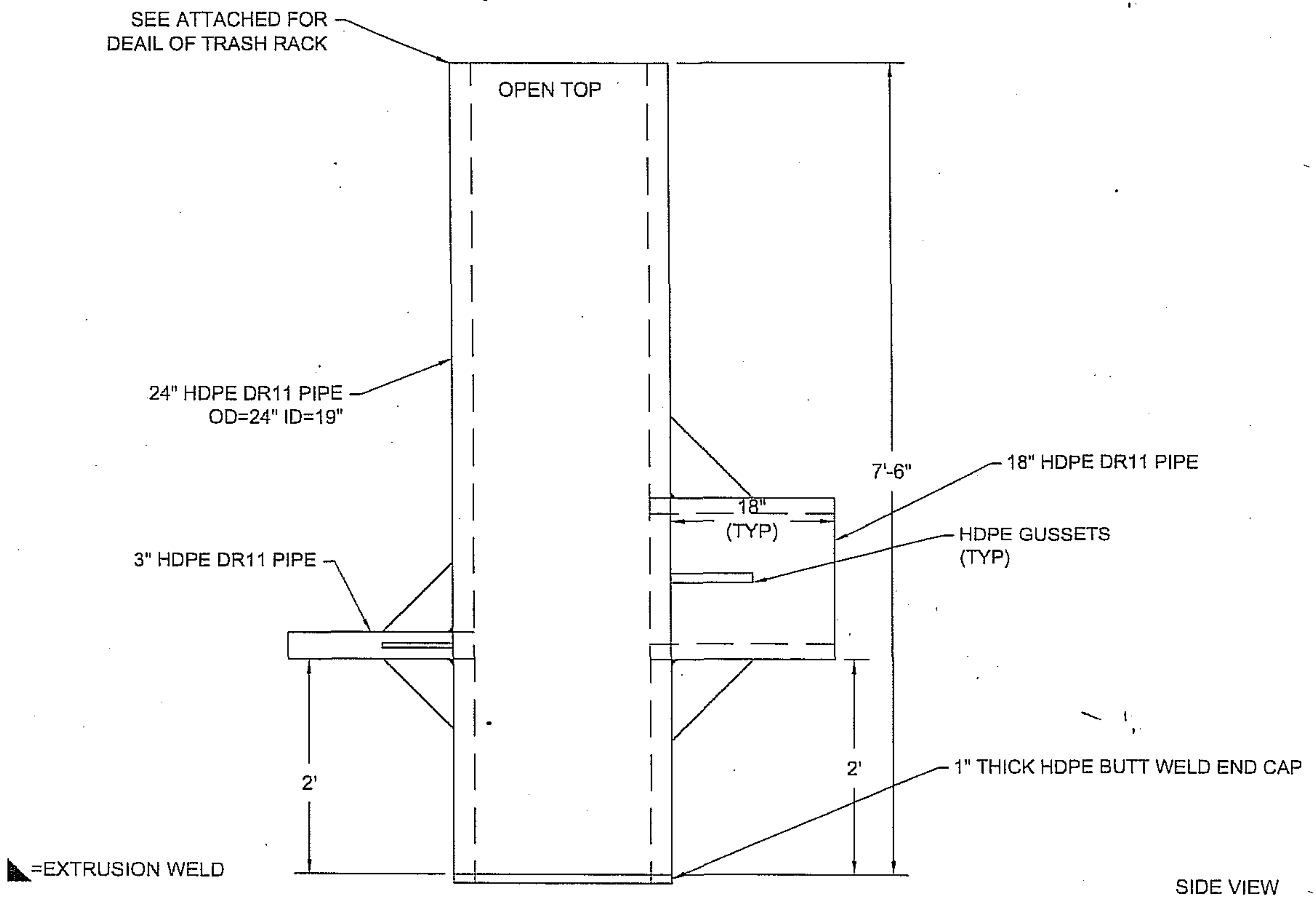
BUNA-N
Resistant to many hydrocarbons, fats, oils, grease, kerosene, and moderate chemicals. Excellent with methane.
Affected By: Ozone, strong acids, hydrogen sulfide and ketones.
Operating Temperature Range: -30° F to +230° F

WHITE FOOD GRADE BUNA-N
Resistant to many hydrocarbons, fats, oils, grease, kerosene, and moderate chemicals. Excellent with methane.
Affected By: Ozone, strong acids, hydrogen sulfide and ketones.
Operating Temperature Range: -30° F to +230° F

HYPALON
Resistant to heat, ozone, weathering, sodium hydroxide (caustic), and oxidizing chemicals. Good resistance to strong acids at room temperature and methane. Resistant to some hydrocarbons, alcohols
Affected By: Aromatic ketones, acetyl compounds, benzene compounds, petroleum oils, wet chlorine gas.
Operating Temperature Range: -50° F to +300° F

VITON
Resistant to many halogenated hydrocarbons, fats, oils, grease, sodium hydroxide (caustic), solvents and most chemicals. Excellent resistance to ozone, oxygen, methane, and weathering.
Affected By: Ketones, esters, hydrogen sulfide, and anhydrous ammonia.
Operating Temperature Range: -10° F to +400° F

WHITE FOOD GRADE VITON
Resistant to many halogenated hydrocarbons, fats, oils, grease, sodium hydroxide (caustic), solvents and most chemicals. Excellent resistance to ozone, oxygen, methane, and weathering.
Affected By: Ketones, esters, hydrogen sulfide, and anhydrous ammonia.
Operating Temperature Range: -10° F to +400° F

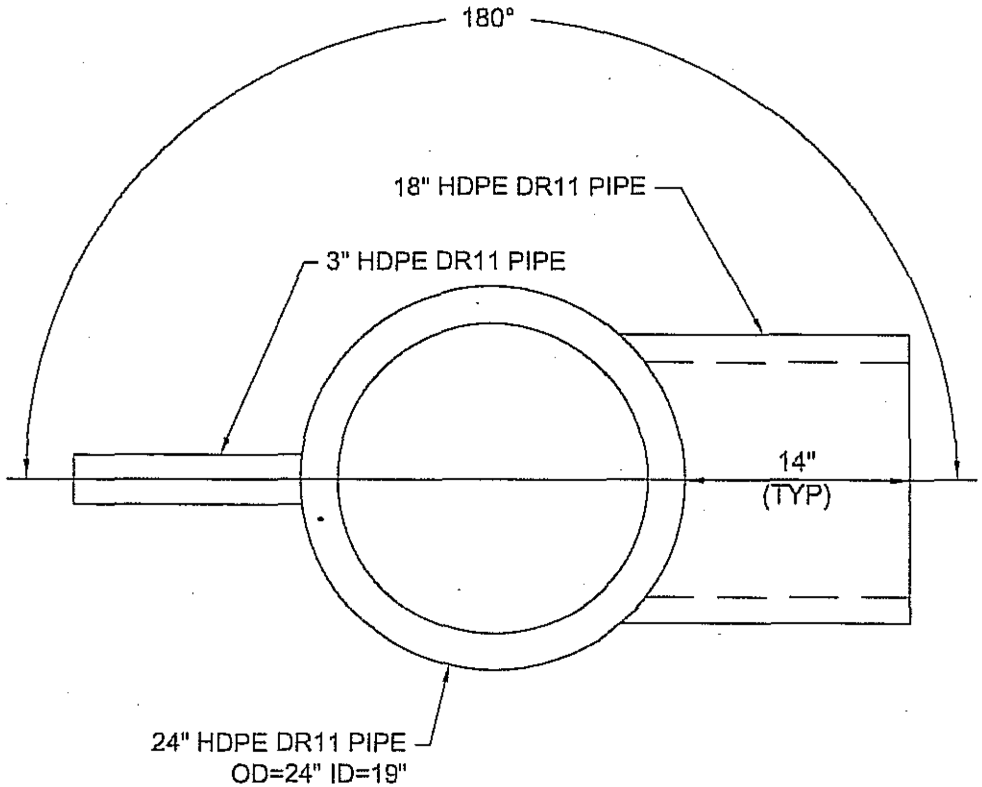


SEVENSON ENVIRON SVS SOUTH PLAIN FIELD
24" HDPE DR11 OUTLET STRUCTURE

*EXTRUSION WELDS ARE NOT PRESSURE RATED.
*DRAWINGS MUST BE SIGNED FOR APPROVAL.
ONCE APPROVED ALL MATERIALS ARE NON
CANCELLABEL/NON RETURNABLE.
*ALL FABRICATIONS WILL BE BASED ON
APPROVED DRAWINGS.

LEE SUPPLY CO INC.
1-800-353-3747

CUSTOMER:	SEVENSON
DRAWN BY:	MATTHEW
DATE:	MAY 20,2011
APPROVED BY:	
REVISIONS:	



TOP VIEW

SEVENSON ENVIRON SVS SOUTH PLAIN FIELD
24" HDPE DR11 OUTLET STRUCTURE

*EXTRUSION WELDS ARE NOT PRESSURE RATED.
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1-800-353-3747

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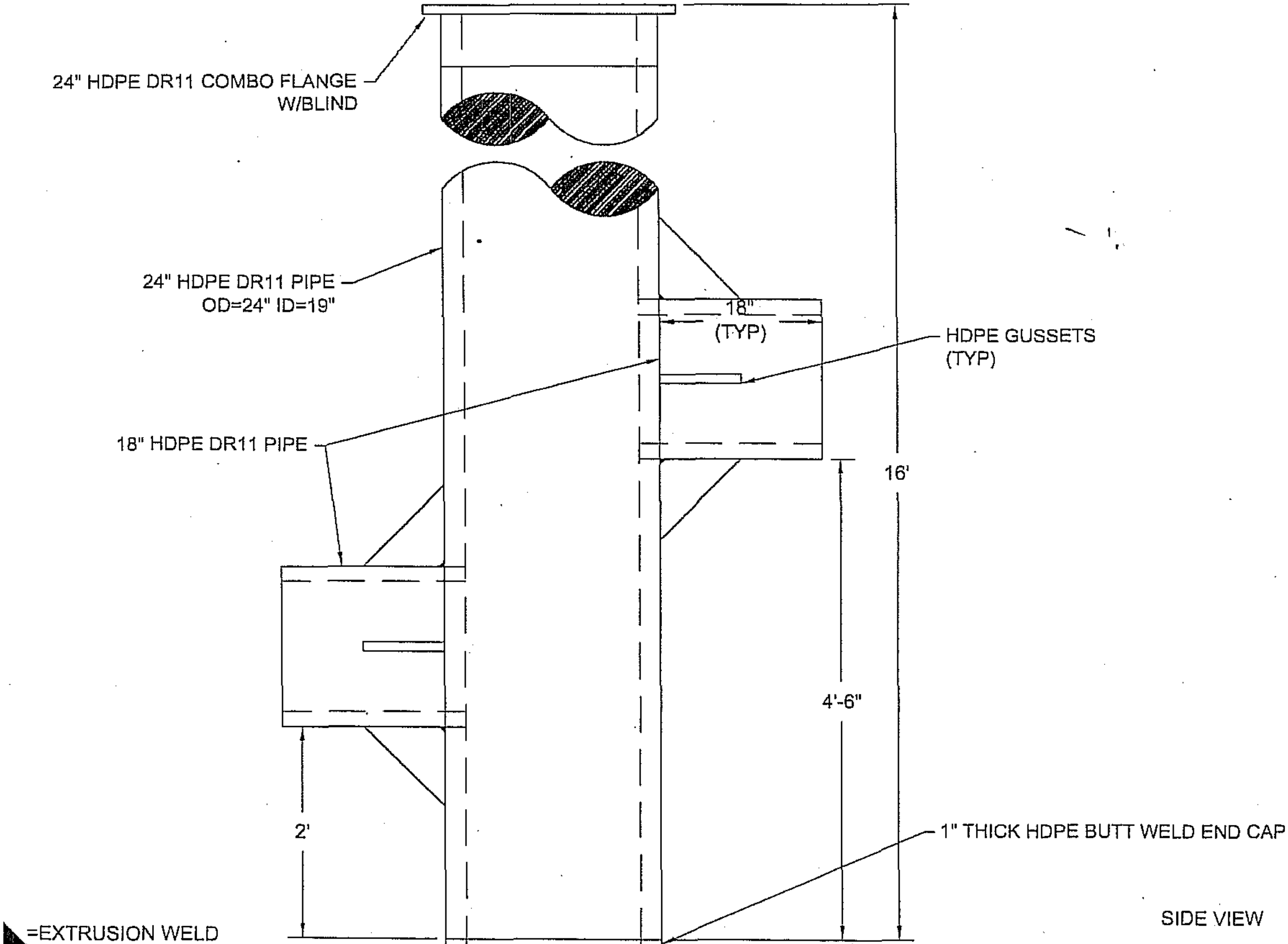
REVISIONS:	



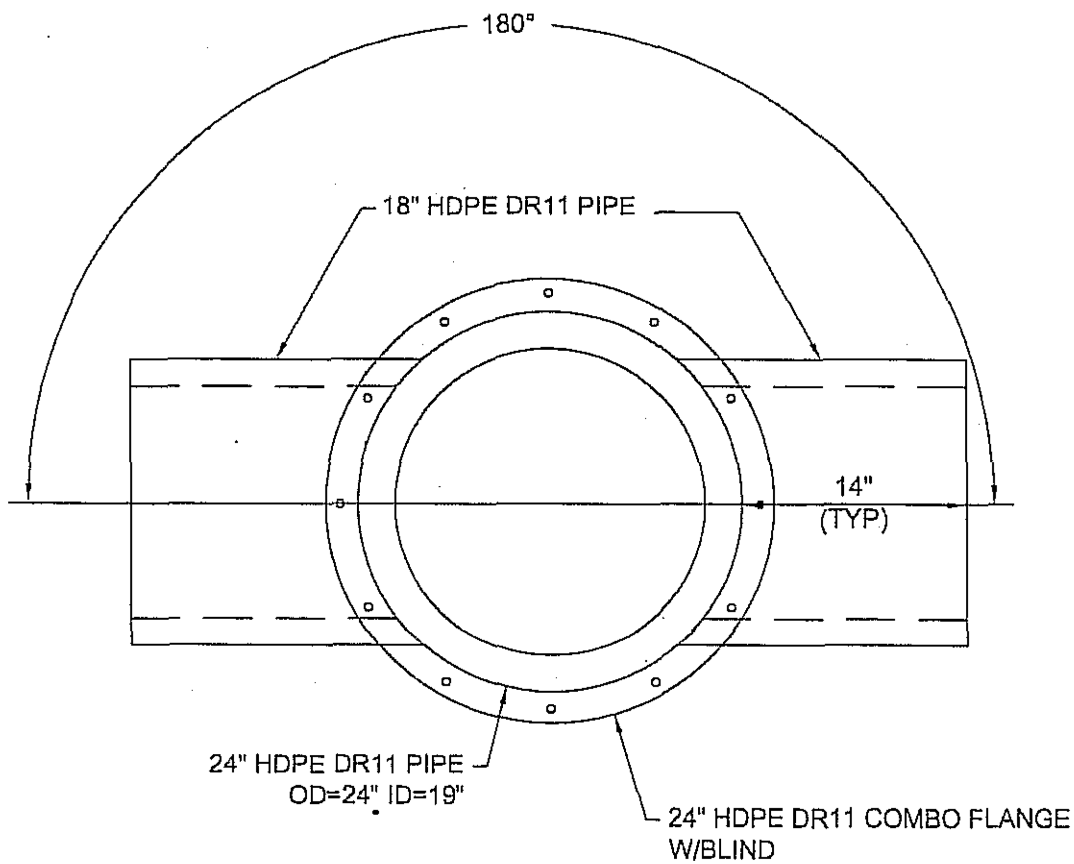
SIDE VIEW

SEVENSON ENVIRON SVS SOUTH PLAIN FIELD
24" HDPE DR11 SECONDARY OUTLET STRUCTURE

*EXTRUSION WELDS ARE NOT PRESSURE RATED.
*DRAWINGS MUST BE SIGNED FOR APPROVAL.
ONCE APPROVED ALL MATERIALS ARE NON CANCELLABEL/NON RETURNABLE.
*ALL FABRICATIONS WILL BE BASED ON APPROVED DRAWINGS.

LEE SUPPLY CO. INC.
1-800-353-3747

CUSTOMER:	SEVENSON
DRAWN BY:	MATTHEW
DATE:	MAY 20,2011
APPROVED BY:	
REVISIONS:	



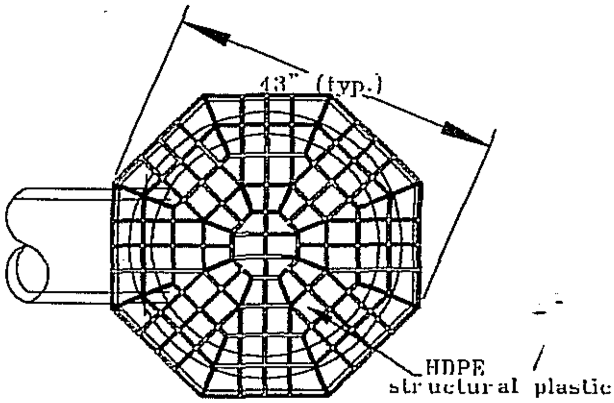
TOP VIEW

SEVENSON ENVIRON SVS SOUTH PLAIN FIELD
24" HDPE DR11 SECONDARY OUTLET STRUCTURE

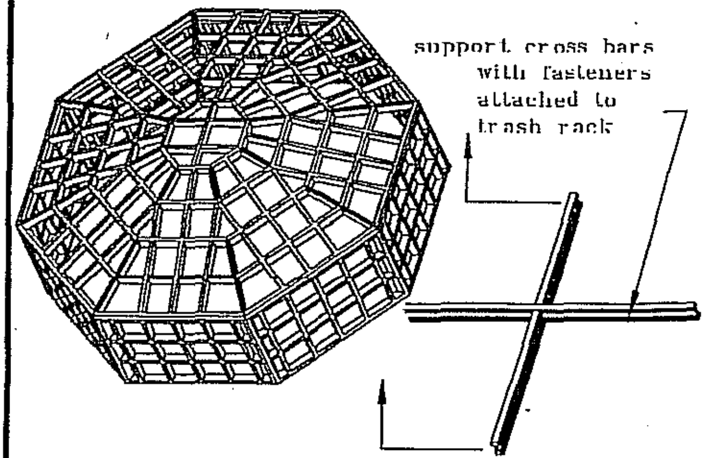
*EXTRUSION WELDS ARE NOT PRESSURE RATED.
*DRAWINGS MUST BE SIGNED FOR APPROVAL.
ONCE APPROVED ALL MATERIALS ARE NON CANCELLABEL/NON RETURNABLE.
*ALL FABRICATIONS WILL BE BASED ON APPROVED DRAWINGS.

LEE SUPPLY CO. INC.
1-800-353-3747

CUSTOMER:	SEVENSON
DRAWN BY:	MATTHEW
DATE:	MAY 20,2011
APPROVED BY:	
REVISIONS:	

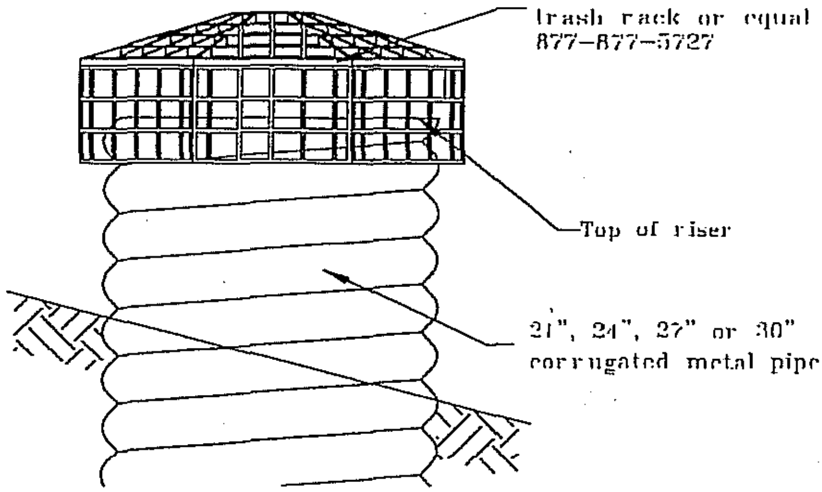


Top View

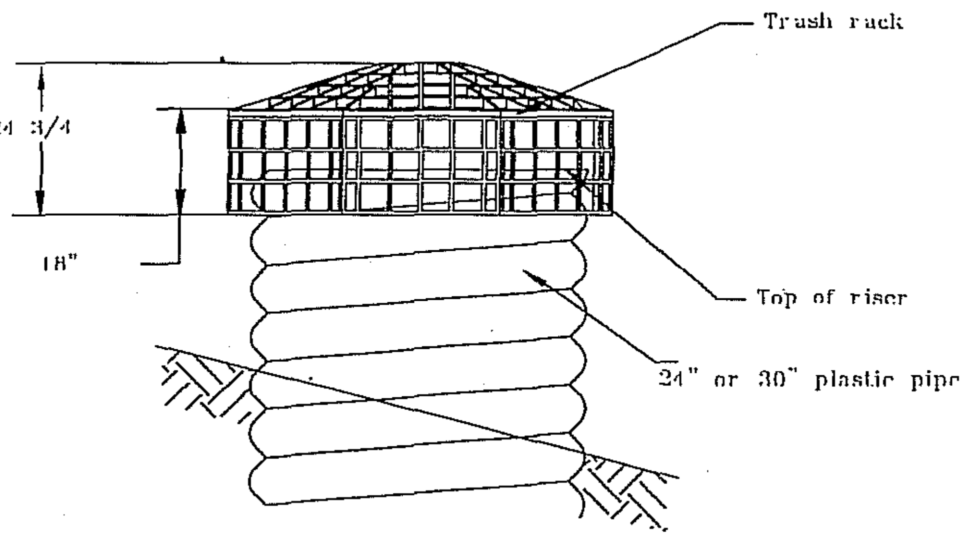


Trash Rack Assembly

metal pipe
Elev. A–A



plastic pipe
Elev. A–A



NOTE: CUSTOM SIZES AVAILABLE UPON REQUEST
FASTENING KIT INCLUDED

PART NO	36" PYRAMID TRASH RACK WITH METAL OR PLASTIC RISER	LEE SUPPLY CO., INC.
PYDP 36		P.O. BOX 35 305 FIRST & LINCOLN AVE. CHARLEROI, PA 15022

SOLMAX
INTERNATIONAL

January 17, 2011

Mr. John Knoeringer
East Coast Liner Co., Inc.
1565 Route 37 West, Unit 11
Toms River, NJ 08755
Phone: 732-341-4000
Fax: 732-341-5412
Email: thelinerguy@aol.com

To Whom it may concern,

This correspondence serves to recognize East Coast Liner Co., Inc. as a certified installer of Solmax International flexible geomembrane products (PE & PVC).

As a certified Installer, East Coast Liner Co., Inc. has to follow the International Association Geosynthetic Installers (IAGI) field installation quality assurance manual.

East Coast Liner Co., Inc. also has access to Solmax International's technical department's representatives who can respond to questions on specifications and installation techniques.

Solmax International Inc. does not warrant nor guarantee the work of a certified installer, hence East Coast Liner Co., In. and/ or it's employees are acting as independent contractors and/ or employees of Solmax International Inc. and they may not grant any right or authority or assume or create any obligation or liability express or implied, for or on behalf of Solmax International Inc. without the written consent of an authorized representative of Solmax International Inc.

On the assumption that you will find the foregoing to your satisfaction.

Sincerely yours,

Silda Rivas
Silda Rivas
2011.03.24
13:42:06 -04'00'

Silda Rivas
South & North American Sales Representative
Solmax International Inc.

Sales Office:
Engineered Synthetic Products, Inc.
Phone (770) 564-1857
Fax (770) 564-1818
www.espgeosynthetics.com

March 31, 2011

IWT Cargo Guard
P.O. Box 454
Waretown, NJ 08758

RE: Approved Installer

To Whom It May Concern:

East Coast Liners, Inc. is an approved installer of Skaps Industries geosynthetics and is in good standing. They are an authorized installer of both our gecomposites and geotextiles. East Coast Liners is authorized to act as a representative of Skaps Industries when installing our products. Please let us know if you have any questions.

Sincerely,

Brent Beckham
ESP/Skaps Industries

SKAPS Industries, 316 S. Holland Dr., Pendergrass, GA 30567, Phone (706) 693-3440, Fax (706) 693-3450, Email: info@skaps.com

Made in U.S.A.

EAST COAST LINER COMPANY

John Knoeringer: Resume

Employment History

2000 - Present	Partner in East Coast Liner Co. Sales, service, installation and repair of all types of lining systems.
1983 - 1999	Field Superintendent and Assistant Quality Control Manager - The Liner Co. Implemented Quality Control procedures and maintained quality control records. Personally involved and assisted in the installation of over 41,000,000 square feet of various lining systems.
1980- 1982	Master Seamer - The Liner Co. Completed installation training provided by Staff Industries (PVC & Hypalon), National Seal Company (HDPE), and Gundle Lining Systems (HDPE).
1977- 1979	Layout and Seaming Technician - The Liner Co. Completed on site field training in panel layout and various types of seaming methods.

Installation History for MPC Petroguard Liners
105,812 Sq ft Installed to date

2010

Waterside 22M Substation
Stamford, CT
GC: Northeast Utilities Service Co.
James D. Livingston
860-665-6790

Secondary Containment
MPC Petroguard VI: 2,340 Sq ft
8 oz. Geotextile: 4,680 Sq ft

BOKUM 15L Substation
Old Saybrook, CT
GC: Northeast Utilities Service Co.
James D. Livingston
860-665-6790

Secondary Containment
MPC Petroguard VI: 1,380 Sq ft
8 oz. Geotextile: 2,760 Sq ft

Montville 4J Substation
Old Saybrook, CT
GC: Charter Oak Utility Constructors, Inc.
Dennis Keiser
860-241-8274

Secondary Containment
MPC Petroguard VI: 5,025 Sq ft
8 oz. Geotextile: 10,140 Sq ft

2010 Continued

Manchester Substation
Manchester, CT
GC: Charter Oak Utility Constructors, Inc.
Dennis Keiser
860-241-8274

Secondary Containment
MPC Petroguard VI: 8,352 Sq ft
8 oz. Geotextile: 16,704 Sq ft

Greenwich Substation
Greenwich, CT
GC: Northeast Utilities Service Co.
James D. Livingston
860-665-6790

Secondary Containment
MPC Petroguard VI: 1,410 Sq ft
8 oz. Geotextile: 2,820 Sq ft

2009

Ludlow Sub Station
Ludlow, MA
GC: Witch Enterprises, Inc.
Lou Ramah
413-786-7314 ext:13

Secondary Containment
MPC Petroguard VI: 6,876 Sq ft
8 oz Geotextile: 13,752 Sq ft

Norwalk Harbor 6J 8x & 9x Transfromer Sump
Norwalk, CT
GC: Charter Oak Utility Cinstructors, Inc.
Dennis Keiser
860-241-8274

Secondary Containment
MPC Petroguard VI: 6,200 Sq ft
8 oz Geotextile: 12,400 Sq ft

Flax Hill 24A Substation
Norwalk, CT
GC: Northeast Utilities Service Company
James D. Livingston
860-665-6790

Secondary Containment
MPC Petroguard VI: 2,376 Sq ft
8 oz Geotextile: 4,752 Sq ft

Rood Ave. 24J Substaion
Windsor, CT
GC: Northeast Utilities Service Company
James D. Livingston
860-665-6790

Secondary Containment
MPC Petroguard VI: 2,196 Sq ft
8 oz Geotextile: 4,392 Sq ft

Mystic 13K Substaion
Mystic, CT
GC: Northeast Utilities Service Company
James D. Livingston
860-665-6790

Secondary Containment
MPC Petroguard VI: 5,712 Sq ft
8 oz Geotextile: 13,500 Sq ft

2009 – continued

Waterford 36f Substation
Waterford, CT
GC: Northeast Utilities Service Company
James D. Livingston
860-665-6790

Secondary Containment
MPC Petroguard VI: 5,784 Sq ft
8 oz Geotextile: 13,500 Sq ft

Plumtree 30G Substation
Bethel, CT
GC: Charter Oak Utility Constructors, Inc.
Dennis Keiser
860-241-8274

Secondary Containment
MPC Petroguard VI: 6,360 Sq ft
8 oz Geotextile: 12,720 Sq ft

2008

Hinsdale Substation
Hinsdale, MA
GC: Northeast Utilities Service Company
James D. Livingston
860-665-6790

Secondary Containment
MPC Petroguard VI: 7,920 Sq ft
8 oz Geotextile: 15,840 Sq ft

Oxford 26N Substation
Oxford, MA
GC: Northeast Utilities Service Company
James D. Livingston
860-665-6790

Secondary Containment
MPC Petroguard VI: 4,560 Sq ft
8 oz Geotextile: 9,000 Sq ft

Norwalk Harbor Transformer Sump
Norwalk, CT
GC: Charter Oak Utility Constructors, Inc.
Dennis Keiser
860-241-8274

Secondary Containment
MPC Petroguard VI: 6,200 Sq ft
8 oz Geotextile: 12,400 Sq ft

Stepstone 35L Substation
Stepstone, CT
GC: Northeast Utilities Service Company
James D. Livingston
860-665-6790

Secondary Containment
MPC Petroguard VI: 4,560 Sq ft
8 oz Geotextile: 9,000 Sq ft

Torrington Terminal 8A Transformer Sump
Torrington, CT
GC: Charter Oak Utility Constructors, Inc.
Dennis Keiser
860-241-8274

Secondary Containment
MPC Petroguard VI: 4,320 Sq ft
8 oz Geotextile: 9,000 Sq ft

2007

Frost Bridge 8R Sub-Station
Watertown, CT
GC: Charter Oak Utility Constructors, Inc.
Dennis Keiser
860-241-8274

Secondary Containment
MPC Petrogard VI: 6,000 Sq ft
8 oz Geotexile: 12,000 Sq ft

Cedar Heights 4R Substation
Stamford, CT
GC: Northeast Utilities
James D. Livingston
860-665-5000

Secondary Containment
MPC Petrogard VI: 3,000 Sq ft
8 oz Geotextile: 6,000 Sq ft

Partridge 15E substation
Pittsfield, Massachusetts
GC: Northeast Utilities
James D. Livingston
860-665-5000

Secondary containment
MPC Petrogard VI: 1,344 Sq ft
8 oz Geotextile: 2,688 Sq ft

Wilton 35A Substation
Wilton, CT
GC: Northeast Utilities
James D. Livingston
860-665-5000

Secondary Containment
MPC Petrogard VI: 4,500 Sq ft
8 oz Geotextile: 9,000 Sq ft

Enfield 12C substation
Enfield, CT
GC: Northeast Utilities
James D. Livingston
860-665-5000

Secondary Containment
MPC Petroguard VI: 1,820 Sq ft
8 oz Geotextile: 3,640 Sq ft

2006

Naval Station Newport
Newport, RI
GC: TN & Associates, Inc.
Chris Miller
865-220-9000

Secondary Containment
MPC Petroguard X: 4,050 Sq ft

2005

PS # 37
Jersey City, NJ
GC: Greg
973-209-2545

Boiler Plant Secondary Containment
MPC Petroguard VI: 1,250 Sq ft

Dickenson High School
Jersey City, NJ
GC: Occidental Construction Co., Inc.
Frank Calderone
732-537-1000

Boiler Plant Secondary Containment
MPC Petroguard VI: 1,050 Sq ft

2001

***GPU Whiting Substation**
Manchester, NJ
GC: Henkels & McCoy
Ed McDonald
215-283-7634
*Subcontracted from The Liner Co.

Secondary Containment
MPC Petroguard VI: 1,200 Sq ft

Sales Office:
Engineered Synthetic Products, Inc.
Tel (770) 564-1857
Fax (770) 564-1818
www.espgeosynthetics.com

Geotextile Product Description Sheet
SKAPS GE-110
Nonwoven Geotextile

SKAPS GE-110 is a needle-punched nonwoven geotextile made of 100% polypropylene staple fibers, which are formed into a random network for dimensional stability. SKAPS GE-110 resists ultraviolet deterioration, rotting, biological degradation, naturally encountered basics and acids. Polypropylene is stable within a pH range of 2 to 13. SKAPS GE-110 conforms to the physical property values listed below:

PROPERTY	TEST METHOD	UNIT	M.A.R.V. (Minimum Average Roll Value)
Weight	ASTM D 5261	oz/yd^2 (g/m^2)	10.0 (339)
Grab Tensile	ASTM D 4632	lbs (kN)	270(1.20)
Grab Elongation	ASTM D 4632	%	50
Trapezoid Tear Strength	ASTM D 4533	lbs (kN)	100(0.44)
Thickness*	ASTM D 5199	mils (mm)	110 (2.79)
CBR Puncture Resistance	ASTM D 6241	lbs (kN)	725 (3.22)
Permittivity*	ASTM D 4491	sec^{-1}	0.94
Permeability*	ASTM D 4491	cm/sec	0.3
Water Flow*	ASTM D 4491	gpm/ft^2($l/min/m^2$)	75 (3055)
AOS	ASTM D 4751	US Sieve (mm)	100 (0.150)
UV Resistance	ASTM D 4355	%/hrs	70/500

PACKAGING	
Roll Dimensions (W x L) – ft	15 x 570
Square Yards Per Roll	950
Estimated Roll Weight – lbs	620

* At the time of manufacturing. Handling may change these properties.

SKAPS Industries,
335 Athena Dr., Athens, GA 30601,
Phone:(706)-354-3700, Fax(706)-354-3737,
www.skaps.com

Made in U.S.A.

SKAPS INDUSTRIES
NONWOVEN DIVISION
316 S.Holland Drive,
Pendergrass, GA 30567

Sales Office:
Engineered Synthetic Products, Inc.
3985 Steve Reynolds Blvd Unit H
Norcross GA USA 30093
www.espgeosynthetics.com
www.skaps.com

QUALITY CONTROL

PROGRAM OUTLINE

SKAPS Industries
Nonwovens
QUALITY CONTROL
PROGRAM OUTLINE

RAW MATERIAL QUALITY CONTROL

All raw materials used in the manufacturing of SKAPS Nonwoven products are certified by the supplier to meet the most stringent production standards in the industry. Each truckload of fiber received by SKAPS Nonwovens is certified by the resin supplier's Quality Control Manager to meet specifications as set by SKAPS Industries. All fiber released to production can be tracked by supplier and individual bale number for up to one year after the fiber is processed.

DEFINITION OF 'LOT'

A Lot is a planned production quantity satisfying all of the following:

- Manufactured under the same material specification.
- Identified as the same style (fabric designation).
- When tested, having physical characteristics consistent with published values.

QUALITY CONTROL CONFORMANCE SAMPLING OF EACH LOT

As a minimum, a number of production units shall be selected at random from each lot in accordance with TABLE 1.

TABLE 1
Number of Units Selected as Lot Samples
Specification Conformance

Number of Units in Lot	Number of Units Selected
1 to 2	1
3 to 8	2
9 to 27	3
28 to 64	4
65 to 125	5
126 to 216	6
217 to 343	7
344 to 512	8
513 to 729	9
730 to 1000	10
1001 or more	11

Note: A production unit is considered to be a shipment roll.

Typically, the first shipment roll from each line will be sampled. It will be necessary to consider the minimum planned production quantity to determine if more frequent sampling and testing is required.

Quality Control Testing of Each Sample:
Each quality control sample shall be sent to the quality control lab before the end of the shift during which the sample was taken.- Full identification of the sampled roll will be provided with the sample.

The following tests are performed on each sample:

TEST PROPERTY	TEST METHOD
Weight	ASTM D 5261
Thickness	ASTM D 5199
Grab Tensile	ASTM D 4632
Grab Elongation	ASTM D 4632
Trapezoid Tear Strength	ASTM D 4533
Puncture Resistance	ASTM D 4833
Mullen Burst Strength	ASTM D 3786
Water Flow Rate	ASTM D 4491
Permeability	ASTM D 4491
Permittivity	ASTM D 4491
U.V. Resistance	ASTM D 4355
Apparent Opening Size (AOS)	ASTM D 4751

Quality Control Test Results:
All quality control test results will be maintained by the Quality Control Manager along with the corresponding shipment roll identification.

The Quality Control Manager will make lot testing summaries available upon request detailing the individual test results and aggregate mean, minimum and standard deviations of each test property for the shipment rolls under consideration.

SKAPS NONWOVENS

QUALITY CONTROL PLAN

The Quality Control Department tests nonwoven fabrics at the following frequencies. The tests for these properties are routine with test results reported representing each roll of fabric produced.

MINIMUM TESTING FREQUENCY IN SQUARE YARDS

PROPERTY	UNITS	TEST METHOD	MINIMUM FREQUENCY SQUARE YARDS
Mass/Unit Area	oz/yd	ASTM D 5261	10,000
Thickness	mils	ASTM D 5199	10,000
Grab Tensile Strength	lbs	ASTM D 4632	10,000
Grab Elongation	%	ASTM D 4632	10,000
Trapezoidal Tear Strength	lbs	ASTM D 4533	15,000
Puncture Strength	lbs	ASTM D 4833	15,000
Mullen Burst	psi	ASTM D 3786	15,000
Apparent Opening Size	U.S. Sieve	ASTM D 4751	65,000
Permittivity	sec^{-1}	ASTM D 4491	65,000
Permeability	cm/sec	ASTM D 4491	65,000
Water Flow	gpm/ft^2	ASTM D 4491	65,000

Additional testing is conducted on non-routine properties in the SKAPS Quality Control Lab or at a reputable independent test lab. Examples of non-routine tests include:

PROPERTY	UNITS	TEST METHOD
Abrasion-Sliding Block	% strength retention	ASTM D 4886
Abrasion-Rotary Platform	lbs	ASTM D 3884
U.V. Resistance-Fluorescent Type	% strength retention	ASTM G 53
U.V. Resistance-Xenon Type	% strength retention	ASTM D 4355
Wide Width	lbs/in	ASTM D 4595

SKAPS conforms and adheres to the following additional ASTM Test Methods relating to fabric identification, sampling and specification conformance:

ASTM D 4873 Identification, Storage and Handling of Geotextiles
ASTM D 4354 Sampling of Geosynthetics for Testing
ASTM D 4759 Determining Specification Conformance of Geosynthetics

02/2004

SKAPS

CIVIL PRODUCTS

Product	GT131	GT135	GT140	GT142	GT160	GT170	GT180	GT110	GT112	GT116
Square Yard	500/600	500/600	500/600	500/600	500	500	500	500	500	250
Testing Frequency, Number of Rolls										
Mass/Unit Area	20/15	20/15	20/15	20/15	20	20	20	20	20	40
Thickness	20/15	20/15	20/15	20/15	20	20	20	20	20	40
Grab Tensile Strength	20/15	20/15	20/15	20/15	20	20	20	20	20	40
Grab Elongation	20/15	20/15	20/15	20/15	20	20	20	20	20	40
Trapezoidal Tear Strength	30/25	30/25	30/25	30/25	30	30	30	30	30	60
Puncture Strength	30/25	30/25	30/25	30/25	30	30	30	30	30	60
Mullen Burst	30/25	30/25	30/25	30/25	30	30	30	30	30	60
AOS	130	130	130	130	130	130	130	130	130	260
Permittivity	130	130	130	130	130	130	130	130	130	260
Permeability	130	130	130	130	130	130	130	130	130	260
Water Flow	130	130	130	130	130	130	130	130	130	260

ENVIRONMENTAL PRODUCTS

Product	GE140	GE160	GE170	GE180	GE110	GE112	GE114	GE116
Square Yard	2250	1500	1300	1150	950	800	650	600
Testing Frequency, Number of Rolls								
Mass/Unit Area	4	6	7	8	10	12	15	16
Thickness	4	6	7	8	10	12	15	16
Grab Tensile Strength	4	6	7	8	10	12	15	16
Grab Elongation	4	6	7	8	10	12	15	16
Trapezoidal Tear Strength	6	10	11	13	15	18	23	25
Puncture Strength	6	10	11	13	15	18	23	25
Mullen Burst	6	10	11	13	15	18	23	25
AOS	28	43	50	56	68	80	100	108
Permittivity	28	43	50	56	68	80	100	108
Permeability	28	43	50	56	68	80	100	108
Water Flow	28	43	50	56	68	80	100	108

02/2004

ROUTINE CHECKS

The following checks of SKAPS nonwoven fabrics ar

1. Visual inspection – Line Inspector inspects fabric
   correct take-up and needle streaks.

2. Metal Detection - Three metal detectors are positic
   needles or other contaminates. If needles are detecl
   and needles are located and removed.

Certifications are required on all fiber purchases to cc
data is required for each shipment.

In SKAPS' SPC system of quality reporting, a request for
from any property failing to meet specification for three

This system has been implemented to correct all non-c
Industries' policy to ship only fabric meeting or exceeding
issued daily summarizing manufacturing production.

SAMPLING FREQUENCY OF WOVEN GEOTEXTILES

The sampling frequency of woven geotextiles exceeds the requirements of ASTM D-4354. ASTM D-4354 requires that the cubed root of the number of rolls in a lot be tested. Following is a table outlining the number of samples to be tested per lot size.

Number of Units in Lot	Number of Units Selected
1 to 2	1
3 to 8	2
9 to 27	3
28 to 64	4
65 to 125	5
126 to 216	6
217 to 343	7

For the purposes of defining a lot to determine sample frequency a truckload quantity will be used. Using style W300 150" X 360', it takes 220 rolls to fill a truck. According to ASTM D-3454, the number of rolls that should be tested is seven.

Product	Rolls/truck	Yds/truck	Yds/beam	Samples/truck	Samples needed
W200 150"X 432'	241	34,704	6,000	10	7
W200 210" X 309'	176	18,128	6,000	6	6
W300 150" X 360'	220	26,400	6,000	8	7
W300 210" X 258'	144	12,384	6,000	6	6
W200 150" X 432'	Sample 1st and 4th master roll off loom for each loom beam				
W200 210" X 309'	Sample 1st and 4th master roll off loom for each loom beam				
W300 150" X 360'	Sample 1st and 4th master roll off loom for each loom beam				
W300 210" X 258'	Sample 1st, 3rd and 5th master roll off loom for each loom beam				

Consider the weave room running style W300 150" X 360' with 6,000 linear yards on yarn on a loom beam. Put-up of master rolls from the loom beam will be approximately 1,000 yards per roll. Six master rolls will be produced from the loom beam. Two samples should be taken from the loom beam. The first sample should be taken from the first master roll off the loom. The second sample should be taken from the fourth master oll doffed from the loom beam.

In the example of using a truckload lot of W300 150" X 360' with 220 rolls on a truck, there will be 26,400 linear yards of fabric in the lot. This translates to approximately 4.4 loom beams of warp yarn per truck for a total of eight samples tested. Since the number of samples tested meet the ASTM method, the requirements of ASTM D-4354 are met.

WOVENS SAMPLING PROCEDURE

W200 150" X 432'	Sample 1st and 4th master roll off loom for each loom beam
W200 210" X 309'	Sample 1st and 4th master roll off loom for each loom beam
W300 150" X 360'	Sample 1st and 4th master roll off loom for each loom beam
W300 210" X 258'	Sample 1st, 3rd and 5th master roll off loom for each loom beam

This test frequency exceeds the requirements in ASTM D-4354.

LAB PROCEDURES

Weight	ASTM D-5261
Grab Tensile	ASTM D-4632
Grab Elongation	ASTM D-4632
Trap Tear	ASTM D-4533
Burst	ASTM D-3786
AOS	ASTM D-4751

SKAPS INDUSTRIES
NONWOVEN DIVISION

GEOTEXTILE INSTALLATION INSTRUCTIONS

SEWING / INSTALLATION GUIDE

NONWOVEN GEOTEXTILES

10/2003

SKAPS INDUSTRIES
Nonwoven Division

Installation Procedure
Geotextile Fabrics

I. Geotextile Unloading & Storage:

A. The geotextile shall be labeled, stored, and handled in accordance with ASTM D 4873, "Guide for Identification, Storage and Handling of Geotextiles".

B. Geotextile rolls are to be unloaded under supervision of the geotextile installer using straps or other devices that will prevent damage to the geotextile material.

C. The geotextile shall be kept dry and wrapped in a waterproof wrapping so that it is protected from UV light and the elements during shipping and storage. Torn wrapping shall be repaired as quickly as possible using an approved protective covering.

D. Rolls should be stored on supports that will not damage the material. The material must be elevated at least 2 inches above the sub grade.

E. If any material is found to be damaged during unloading, a notation should be made as to the roll number, location of damage and type. This information should be given to the Project Manager.

II. Material Deployment

A. No material is to be deployed until the Project Inspector has inspected and approved installation of the geotextile.

B. Material will not be deployed when moisture, high winds, or other adverse weather conditions are expected. This determination will be made by the Field Installation Superintendent (FIS).

C. Geotextile materials are to be deployed using methods that will not damage the material. The material will be visually inspected during deployment and any faulty or unsatisfactory areas will be marked for corrective action.

D. If necessary, temporary sand bags may to be used to prevent material uplift and movement from winds during geotextile installation. The number and location of sand bags will be determined by the FIS.

E. All folds and excessive wrinkles are to be removed prior to sewing adjacent panels together.

F. On slopes, the geotextile shall be anchored at the top and unrolled down the slope.

G. Material may be deployed by one three methods, it may be overlapped, sewn or heat seamed together as specified by the site engineer.

III. Material Seaming

A. Field seams are to be made by using sewing machines and thread specifically adapted for this purpose.

B. Adjacent panels are to be overlapped a minimum of six inches and sewn together. A sewing crew is to consist of a sewing machine operator and at least one assistant to help align the materials. The machine operator and assistant are to inspect opposite sides of the seam for dropped or incorrect stitches.

C. Seams shall be sewn utilizing one or two rows of stitching. Each row shall consist of 4 to 7 stitches per inch.

D. Damaged areas of geotextile are to be patched with an additional layer of geotextile material. The patch is to overlap the damaged area by a minimum of six inches on each side and is to be heat bonded to the main layer of geotextile.

E. Thread should be of contrasting color to the fabric to facilitate seam inspection.

F. The installer shall ensure that no soil materials are present within seams or overlaps.

G. See below for heat seaming instructions.

IV. Project Documentation

A. The FIS will maintain the following documentation on a daily basis:

1. Log of job activities, including number of personnel, weather conditions, and quantity of geotextile deployed.

2. Listing of material placed, including panel size and location, and a cross reference of panel numbers.

3. Listing of patches and repairs, including location and reason.

B. Upon completion of the project, the following documentation is to be provided to the owner or inspector:

1. Copies of Items 1, 2, and 3 above.

2. Copies of Material Certifications from the Geotextile Manufacturer, if required by the project specifications.

THREAD SPECIFICATION

Threads used to sew geotextiles should be:

- Polyester, Polypropylene, or Nylon
- Bonded and Thermally Set
- 1800 Denier Minimum

SKAPS Nonwovens recommends the use of BT207 - nylon sewing thread which meets or exceeds all these criteria.

Unless otherwise specified, the thread should be of contrasting color to the fabric to facilitate seam inspections.

Thread weight is typically expressed as "denier" or "tex". Denier is the weight in grams of 9000 linear meters of thread. Tex is the weight in grams of one kilometer of thread.

2000 denier = .222 g/m

230 tex = .230 g/m

For example, one pound of 2000 denier thread contains approximately 6,700 feet (2045 m) of thread.

THREAD CONSUMPTION

Thread consumption is the length of thread required to sew a linear seam, i.e., seven feet of thread is required to sew one foot of seam. Thread consumption rates for the two-thread and single-thread machines are as follows:

Machine	Length Ratio Thread:Stitch
Two-Thread, Double-Locked Stitch	7:1
Single Thread, Chain Stitch	4:1

NEEDLES

Needle size is critical to the efficiency of the sewing operation. Needles should be compatible with machine and sewing thread. Needles are available through sewing machine manufacturer representatives.

SEWING MACHINES

MODELS

Field seaming of geotextiles can be accomplished with the following types of sewing machines:

Single Thread, Chain Stitch
Union Special, American Newlong, or equal
(Federal Class 101)

(Refer to the Federal Standard on stitches, seams and stitching).

SEAMS AND STITCHES

SEAMS

Three seams that will provide optimum strength for geotextile sewing are the Flat (Prayer) seam, the "J" seam, and the Butterfly-folded seam.

When sewing a flat seam, the stitching should be approximately 1.5 inches from the outside edge of the fabric (not in the selvage or at the selvage edge). The "J" fold and Butterfly fold seams require a fold of 1.25 inches to 2 inches from the fabric edge with the stitching approximately 1 inch from the folded edge.

Care should be taken with either seam to assure that the two fabric edges are even during seaming.

Folders can be attached to the sewing machine to fold and guide the edges of the two fabric layers into the sewing head.

STITCHES

Seams should contain between four and seven stitches per inch to assure adequate strength.

SKAPS Nonwovens

HEAT SEAMING
of
Nonwoven Geotextiles

/

HEAT SEAMING INSTALLATION

On geotextiles seven (7) ounces per yard or heavier, fusion seaming with a heat gun may be used. The minimum overlap for this type of welding is four (4) inches. Prior to fusion seaming the geotextile together, the installer must demonstrate to the Field Engineer the ability to perform this type of installation. Areas burned through by fusion welding shall be properly repaired. Care should be taken during installation to prevent damage to the geotextile. Torn or punctured material shall be patched with sufficient overlap to prevent separation.

SKAPS Nonwovens

SEWING PROCEDURE

Fabric layers should be placed on the ground (preferably firm ground) so that the edges to be sewn are parallel and overlapping. This can be accomplished by a variety of placement techniques. The sewing operation typically requires three men; a machine operator and a man on each side of the machine to aid in fabric throughout. The lead man should hold the fabric edges evenly together and feed the fabric into the sewing machine head or folder. The man behind the machine should hold tension on the fabric so the machine operator has a taut and straight edge to sew across. All three men advance at the machine sewing speed.

If the machine misses a stitch or runs off the fabric, terminate the seam by cutting and tying the thread. Begin a new seam approximately one foot behind the broken seam.

SKAPS

CHEMICAL RESISTANCE OF POLYPROPYLENE GEOTEXTILES

SKAPS Industries nonwoven geotextiles are manufactured from polypropylene with ultraviolet stabilizing additives. The excellent chemical resistance of SKAPS Industries polypropylene geotextiles is one of the qualities which has established SKAPS Industries as a leading producer of geotextiles for use in the waste containment industry. This technical note addresses the chemical resistance of polypropylene with a focus on recent testing programs which have clearly demonstrated the durability of SKAPS Nonwovens fabrics in a variety of chemical environments.

Of the polymers used to manufacture geotextiles, polypropylene exhibits the greatest resistance to chemical attack. In fact, polypropylene is the polymer of choice for such commonly used products as synthetic grass for athletic fields, outdoor carpeting, battery cases, bleach bottles, antifreeze jugs, washing machine agitators, and thousands of other commonly used items that are routinely exposed to chemical environments. Polypropylene is stable within a pH range of 2 to 13, making it one of the most stable polymers available for manufacturing geotextiles. Polypropylene geotextiles have been found to be durable in a wide range of chemical environments, (Bell, et. al., 1980; Haxo, 1978, 1983; Pucetas, et. al., 1991; Tisinger, et. al., 1989). Research has found both woven and nonwoven polypropylene geotextiles to be nonbiodegradable and resistant to commonly encountered soil-bound chemicals, landfill leachates, mildew, and insects.

Numerous laboratory test programs have subjected polypropylene to severe chemical environments such as solutions of organic solvents, oils, organic acids and inorganic acids. The laboratory tests are generally performed in accordance with ASTM D 543. "Standard Test Method for Resistance of Plastics to Chemical Reagents". These test programs have found polypropylene to exhibit superb chemical resistance.

In the ASTM D 543 procedure, specimens are immersed in a concentrated chemical solution at a specified temperature for a specified exposure period. This test method exposes the polypropylene to extremely harsh conditions which are considerably more severe than those encountered in most civil engineering applications.

The chemical compatibility of geotextiles with leachates is determined by EPA Test Method 9090 (EPA 9090), "Compatibility Test for Wastes and Membrane Liners". This is the laboratory method used in the geotextile test programs. Geotextile samples are immersed in a constant temperature leachate bath for four months. At the end of each month, samples of the fabric are removed and subjected to physical testing. Changes in properties may indicate chemically imposed degradation.

In all testing programs there was no indication of geotextile degradation due to exposure to landfill leachates. These results demonstrate the excellent chemical resistance of polypropylene geotextiles and their suitability for use in waste containment applications.

HAZARDOUS WASTE LEACHATE

A laboratory testing program was performed to evaluate the chemical compatibility of polypropylene geotextiles with a hazardous waste leachate. The program included EPA 9090 testing of nonwoven specimens. The testing exposed the geotextile to leachate in both the laboratory and in a leachate collection sump at a hazardous waste landfill.

Test evaluation incorporated detailed microstructural analyses which are not typically incorporated into chemical resistance testing programs. Methods included differential scanning calorimetry, thermal gravimetric analysis, and infrared spectro-photometry. These analyses were performed to isolate any changes in the microstructure of the geotextile due to immersion in the leachate.

The results of this testing program found the geotextile microstructure remained intact, stable, and unchanged. These results demonstrate the superior chemical resistance of polypropylene geotextiles in hazardous waste applications.

MUNICIPAL WASTE LEACHATE

The chemical resistance of polypropylene geotextiles to municipal solid waste leachate was evaluated in laboratory testing programs. The testing programs evaluated changes in physical properties of the specimens, including dimension, thickness, grab tensile strength and elongation, puncture resistance, burst strength, and tear strength. In all cases there were no measurable changes in physical properties of the specimens after exposure to leachate.

All SKAPS Nonwovens geotextiles are equally resistant to chemical degradation because all are manufactured using the same polymer and additives. This conclusion is supported by the test results which demonstrated no difference in chemical resistance for different types of SKAPS Nonwovens geotextiles. This technical note is considered to be applicable to all SKAPS Nonwovens geotextiles regardless of weight, thickness, or strength.

SKAPS INDUSTRIES
Nonwoven Division

Material Safety Data Sheet (MSDS)

Section 1 – Product Identification

Manufacturer's Name:

SKAPS Industries, Nonwoven Division
316 S. Holland Drive
Pendergrass, GA 30567

Emergency Phone Number:

(706) 693-3440

Date Prepared:

October 21, 2003

Section 2 – Hazardous Ingredients

No hazardous components in geotextile fabrics at or above threshold limit values.

Section 3 – Physical/Chemical Characteristics

Boiling Point:	Not Applicable
Vapor Pressure:	Not Applicable
Specific Gravity:	0.90 – 0.905
Melting Point:	120 – 170 Degrees (C)
Vapor Density:	Not Applicable
Evaporation Rate:	Not Applicable
Solubility in Water:	Not Applicable
Appearance and Odor:	Essentially Odorless

Section 4 – Fire and Explosion Hazard Data

Flash Point: >600 Degrees (F)

Extinguishing Media: Dry Chemical, CO^2, Foam, Water, Halon

Special Fire Fighting Procedure:
Avoid inhalation of vapors. Use self-contained breathing apparatus when fire fighting in confined areas.

Unusual Fire and Explosion Hazards:
Treat as a solid that can burn. Generally burns slowly with low smoke density and flaming drips. Burns with high smoke density under certain conditions.

Section 5 – Reactivity Data

Material is stable.

Hazardous polymerization will not occur.

Section 6 – Health Hazard Data

Primary Routes of Entry:
Inhalation - Negligible
Skin Contact - Negligible
Indigestion - Not applicable

Carcinogen: Not a carcinogen

Emergency and First Aid Procedure:
Eye Contact: Flush with water.
Skin Contact: Treat as thermal burn if contact with molten.

Section 7 – Precautions for Handling and Use

Practice reasonable care and caution in handling.

Waste Disposal: Place in appropriate disposal facility in compliance with local regulations.

Storage: In cool, dry location away from oxidizing materials.

Section 8 – Control Measures

Use NIQSH respirators when hot/molten product.

Protective Gloves: Required when handling molten product.

Practice general hygiene by washing hands and clothes after handling.

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QUALITY CONTROL

PROGRAM OUTLINE

SKAPS INDUSTRIES
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GENERAL

Scope
The following describes parameters for the manufacture, supply, and installation of SKAPS Industries Drainage Net and Geocomposite. SKAPS Industries is dedicated to manufacturing the finest quality geosynthetics under the most rigorous testing protocol.

Qualifications
SKAPS Industries has successfully manufactured over 100,000,000 square feet of polyethylene drainage net each of the past ten years. SKAPS Industries operates three state-of-the-art Geonet Extrusion Lines. This ensures that our customers who have special project-specific requirements are serviced without interfering with standard daily production.

Manufacturing Quality Assurance
SKAPS Industries maintains laboratories at each of our manufacturing facilities. These Facilities maintain strict quality control over our products using the best and latest in testing equipment and techniques. The quality control testing laboratory is designed around the latest GRI and ASTM procedures and standards.

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MATERIALS

Drainage Net

The drainage net is manufactured by extruding two sets of polyethylene strands to form a three dimensional structure to provide for planar flow. The drainage net is manufactured with virgin polyethylene resin manufactured specifically for the intended application. The natural polyethylene resin without the carbon black shall meet the following requirements:

Property Test Method Requirements
Density, g/cc ASTM D 1505 > 0.94
Melt Index, g/10 min. ASTM D 1238 < 1.0

The drainage net is manufactured in Commerce GA. Labels on each roll shall identify the thickness of the material, the width and length of the roll, roll number, and name of the manufacturer.

Geotextile

The geotextile shall be a non-woven, needle punched polypropylene fabric manufactured by SKAPS Industries. SKAPS nonwoven geotextile is a superior quality, nonwoven geotextile produced by needlepunching together 100% polypropylene staple fibers in a random network to form a high strength dimensionally stable fabric. The polypropylene fibers are specially formulated to resist ultraviolet light deterioration, and are inert to commonly encountered soil chemicals. The fabric will not mildew, is non-biodegradable, and is resistant to damage from insects and rodents. Polypropylene is stable within a ph range of 2 to 13.

Geocomposite

The geocomposite shall consist of the SKAPS Industries HDPE drainage net heat bonded to one layer or sandwiched between two layers of geotextile to create a single-sided or double-sided geocomposite. The geotextiles shall extend 6 inches beyond the edges of drainage net on both sides of the geocomposite roll.

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GEONET / GEOCOMPOSITE TESTING PROCEDURES

QC Sampling Schedule

All tests are performed every 35,000 square feet of production except for compressibility, which is tested once per shift (approximately every 250,000 square feet of production). Transmissivity is done on a requested basis.

Weight / Area (ASTM D 5261)

The width is determined by measuring the sample in three places--once across each cut end and once across the center. The three measurements are then averaged and reported in inches. The length is also determined by measuring three places--along both edges and along the center. These values are averaged and reported in inches. Samples are then taken and weighed to the nearest .001 lb/sf. The weight is divided by the average width to obtain a weight per length value. The weight/length number is divided by the average width value to obtain weight per area. The value is reported in lbs/sf.

Thickness (ASTM D 5199)

Five specimens are cut from across the width of the lab sample. A thickness gauge with a ¾ inch presser foot is used to measure the thickness of each specimen. The values are recorded and reported as an average in inches.

Tensile Strength (ASTM D 5035)

Five specimens are cut from across the width of the lab sample. They are then placed in the jaws of the Instron Machine and a load is applied at a constant strain of 12 in/min until yield. The results of the tensile test are then averaged and recorded.

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<u>% Carbon Black (ASTM D 4218)</u>
The carbon black test determines the percent by weight of the product that is carbon black. The percent of carbon black is the ratio of the residue weight after pyrolysis in a muffle furnace compared to the weight of input specimen. Two grams of the net are cut and placed in aluminum dishes. The samples are then placed in a muffle furnace for ten minutes at 600 degrees centigrade. The samples are removed and allowed to cool. The carbon black percentage is calculated and recorded.

<u>Ply Adhesion (ASTM D 7005)</u>
Five specimens are cut from across the entire width of the composite sample, each measuring one inch wide by ten inches long. The strain rate for the test is 10 in/min. The fabric is clamped in one jaw of the Instron machine while the net is clamped in the other. The fabric is pulled away from the net to test the adhesion of the fabric to the net.

<u>Transmissivity (ASTM D 4716)</u>
The transmissivity test for the composite is identical to the test for the geonet.

<u>Melt Index (ASTM D 1238)</u>
The melt index determines the rate of the extrusion of the molten resin through a die of specified length and diameter at a temperature of 190 degrees centigrade under a load of 2.16 kg and is measured in g/10min. A sample of approximately 2.5 grams of geonet is then put through the melt plastometer to verify flow rates.

<u>Density of Polymer (ASTM D 1505)</u>
Taking samples from the melt index test, small strands are cut and measured in a density column. A mixture of distilled water and isopropyl alcohol is used as the suspension fluid.

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Transmissivity (ASTM D 4716)

The transmissivity test measures the inplane flow of water across the net sample. In the standard test, the sample is placed between two steel plates with the water temperature at 20 degrees centigrade. Different gradients and loads are applied to the sample. The values are then calculated and converted to gallons per min/ft, or meters^2/sec. Transmissivity is not a standard manufacturing quality control test but rather a design indicator and is tested on a per project request basis.

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TRANSNET

DRAINAGE NET

GEOCOMPOSITE

HANDLING AND INSTALLATION MANUAL

SKAPS INDUSTRIES
GEONET DIVISION

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Introduction

Geocomposites provide a solution to various drainage problems. As with any synthetic product, the quality assurance and quality control does not stop once the product is shipped from the factory. Whether the product has been specified for vertical wall hydrostatic relief or horizontal flow zones for landfill cells/closure and roadways, care in handling and installation is critical to the future functioning of the product.

TRANSNET is manufactured utilizing high quality HDPE resin and lamination of high strength to weight ratio nonwoven geotextiles. The lamination process is completed at the same location where the net is manufactured, minimizing additional handling and allowing for supply of custom lengths. TRANSNET can have one or both sides laminated in order to meet the design specification.

Manufacturing

TRANSNET is manufactured utilizing state-of-the-art counter rotating dies and the highest quality resin. TRANSNET is manufactured with the addition of carbon black to stabilize against degradation from UV exposure.

Packaging

Upon completion of the lamination process, the geocomposite will be wrapped in an opaque wrap to prevent exposure to UV and for protection from the weather, dust, etc. In the event only TRANSNET is required, shipping in a wrapper is not necessary.

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Each roll will be labeled or tagged so that the following information is available at all times from the manufacturer:

- Manufacturer's Name
- Product Identification
- Lot Number
- Roll Dimensions

Shipping and Storage

Geocomposite rolls will be shipped in original packaging. In the event the packaging is damaged during shipment, repairs should be made to ensure protection against UV and weather. Care should be used during the off loading to ensure that the machinery used does not penetrate packaging.

Storage of the rolls prior to installation should be in an area where they are not in standing water. For storage longer than 30 days, rolls should be elevated off the ground with tires, pallets or 2x4's to prevent water from saturating the bottom row. The stack should then be covered with a material that will give additional protection from the elements. Should the product be exposed to excessive dust, the product should be washed prior to installation.

Site Preparation

The design engineer will determine how and where the geocomposite is to be utilized. With any application, care should be used in placing net or composite so that it is not damaged by stones or other protrusions that may compromise the functionality of the product.

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Installation

TRANSNET should be installed by hand. Once the roll is delivered to the installation location via rubber-tired loader or other appropriate machinery, the rolls should be inspected for any damage from shipping or handling. Once the rolls are positioned, they should be unrolled by hand. For slope applications, the rolls should be rolled from top to bottom and hand tightened to remove any wrinkles. The TRANSNET portion of adjacent rolls shall be overlapped two to four inches or according to the Engineer's recommendation. When placing TRANSNET end to end, overlap in shingle placement fashion a minimum of one foot. For end-to-end placement, the top layer of geotextile shall be peeled back and excess TRANSNET will be trimmed so that the top layer of geotextile covers the attachment of the two layers of geocomposite. The TRANSNET will be attached to adjacent rolls utilizing plastic wire ties. These ties will be placed at a maximum spacing of 5 feet along the sides of the rolls and a maximum of 2 feet for end to end attachment, or according to the Engineer's specification.

Metal ties or hog rings are not to be used.

Anchoring

For slope applications, TRANSNET should be placed in a trench so that pull out or slippage is prevented. The trench should be in accordance with the Design Engineer's requirements. Sand bags should be on hand at all times and placed on edges not seamed to prevent uplift from the wind. Welding of the TRANSNET to HDPE liner or any other geomembrane is not recommended.

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INSTALLATION GUIDELINES

Nonwoven Geotextile, Nets and Composites

Heat Seaming

Nonwoven Separate or Laminated

Nonwoven geotextiles can be joined together by using fusion seaming methods. The minimum overlap for this type of welding is four inches. Prior to fusion seaming the geotextile together, the installer must demonstrate to the Field Engineer the ability to perform this type of installation method. Areas burned through that are damaged by fusion welding shall be properly repaired. Care should be taken during installation to prevent damage to the geotextile. Torn or punctured material shall be patched with sufficient overlap to prevent separation.

Sewing Procedure

Nonwoven Separate or Laminated

Fabric layers should be placed on the ground (preferably firm ground) so that the edges to be sewn are parallel and overlapping. The sewing operation typically requires three men--a machine operator and a man on each side of the machine. The lead man should hold the fabric edges evenly together and feed the fabric into the sewing machine head or folder. The man behind the machine should hold tension on the fabric so the machine operator has a taut and straight edge to sew across. If the machine misses a stictch or runs off the fabric, terminate the seam by cutting and tying the thread. Begin a new seam approximately one foot behind the broken seam.

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Overlapping

Nonwoven Separate or Laminated

Roll goods form of geotextile should be overlapped a minimum of 12". Care should be taken that roll goods remain parallel to each other. Extreme care should be taken to assure that soil does not intrude into the composite structure thus clogging the drainage net.

SKAPS Industries

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Phone (770)564-1857

DRAINAGE PRODUCT DESCRIPTION SHEET

TRANSNET 220-2-6

Transnet 220-2-6 is a superior quality drainage media made by extruding two sets of HDPE strands together to form a diamond shaped net. The net is then heat laminated on two sides to a 6 ounce non-woven fabric. This three dimensional structure provides excellent planar liquid flow. SKAPS drainage geocomposites are manufactured from first quality virgin resin geonets and a full range of nonwoven geotextiles. The Transnet 220-2-6 certifies to the physical property values listed below:

NET PROPERTY	TEST METHOD	UNITS	MINIMUM AVERAGE ROLL VALUE
Mass Per Unit Area	ASTM D-5261	lbs/ft^2	0.162
Thickness	ASTM D-5199	inches	0.220 +/- .02
Density of Polymer	ASTM D-1505	g/cm^2	0.94
Carbon Black	ASTM D-4218	%	2-3
Melt Index	ASTM D-1238	g/10min.	1 max
Tensile Strength	ASTM D-5035	lbs/in.	45
Ply Adhesion	ASTM D-7005	lb/in	1
Transmissivity (geocomposite)	ASTM D-4716	gpm/sf	1×10^{-4}*

*Transmissivity measured using water at 20 Degrees C with a gradient of 0.1 between steel plates, under a confining pressure of 10,000 psf, after 15 minutes. Values may vary based on dimension of the transmissivity specimen and specific laboratory.

STYLE SKAPS GE160

SKAPS GE160 is a superior quality, nonwoven geotextile produced by needlepunching together 100% polypropylene staple fibers in a random network to form a high strength dimensionally stable fabric. The polypropylene fibers are specially formulated to resist ultraviolet light deterioration, and are inert to commonly encountered soil chemicals. The fabric will not mildew, is non-biodegradable, and is resistant to damage from insects and rodents. Polypropylene is stable within a ph range of 2 to 13. SKAPS GE160 conforms to the physical property values below:

FABRIC PROPERTY	TEST METHOD	UNITS	MINIMUM AVERAGE ROLL VALUE
Weight	ASTM D-5261	oz.	6.0
Grab Tensile	ASTM D-4632	lbs	160
Grab Elongation	ASTM D-4632	%	50
Trap Tear	ASTM D-4533	lbs	65
Puncture	ASTM D-4833	lbs	95
Water Flow Rate	ATMD D-4491	gpm/ft^2	125
Permittivity*	ASTM D-4491	sec^{-1}	1.63
Permeability*	ASTM D-4491	cm/sec	0.48
AOS	ASTM D-4751	US Sieve	70 max
UV Resistance	ASTM D-4355	% hrs	70 @ 500
Roll Size			14.5' x 250'

*At time of manufacturing. Handling may change these properties.

SOLMAX INTERNATIONAL

TECHNICAL DATA SHEET

Geomembrane HDPE Textured DS[(3)]

Solmax International Inc., 2801 Boul. Marie-Victorin, Varennes, Qc, Canada, J3X 1P7
Tel.: (450) 929-1234 Fax: (450) 929-2550 www.solmax.com

PROPERTY	TEST METHOD	FREQUENCY [(1)]	UNIT Imperial	Solmax 440T-1000
SPECIFICATIONS				
Thickness (min. avg.)	ASTM D-5994	Every roll	mils	38.0
Lowest individual for 8 out of 10 values			mils	36.0
Lowest individual for 10 out of 10 values			mils	34.0
Asperity Height (min. avg.) (3)	ASTM D-7466	Every roll	mils	15
Resin Density	ASTM D-1505	1/Batch	g/cc	> 0.932
Melt Index - 190/2.16 (max.)	ASTM D-1238	1/Batch	g/10 min	1.0
Sheet Density	ASTM D-1505	Every 2 rolls	g/cc	> 0.94
Carbon Black Content	ASTM D-4218	Every 2 rolls	%	>2.0 / <3.0
Carbon Black Dispersion	ASTM D-5596	Every 6 rolls	Category	Cat. 1 & Cat. 2
Oxidative Induction Time (min. ave)	ASTM D-3895	1/Batch	min	100
Tensile Properties (min. avg) (2)	ASTM D-6693	Every 2 rolls		
Strength at Yield			ppi	88
Elongation at Yield			%	12
Strength at Break			ppi	88
Elongation at Break			%	150
Tear Resistance (min. avg.)	ASTM D-1004	Every 6 rolls	lbf	30
Puncture Resistance (min. avg.)	ASTM D-4833	Every 6 rolls	lbf	90
Dimensional Stability	ASTM D-1204	Every 6 rolls	%	± 2
Stress Crack Resistance (SP-NCTL)	ASTM D-5397	1/Batch	hr	400
Oven Aging - % retained after 90 days	ASTM D-5721	Per formulation		
HP OIT (min. avg.)	ASTM D-5885		%	80
UV Resistance - % retained after 1600 hr	GRI-GM-11	Per formulation		
HP-OIT (min. avg.)	ASTM D-5885		%	50
SUPPLY SPECIFICATIONS *(Roll dimensions may vary ±1%)*				
Roll Dimension - Width	-		ft	22.3
Roll Dimension - Length	-		ft	780
Area (Surface/Roll)	-		sf	17 394

NOTES

1. Testing frequency based on standard roll dimensions and one batch is approximately 180,000 lbs (or one railcar).
3. Of 10 readings; 8 out of 10 must be >7 mils (0.18 mm), and lowest individual reading must be >5 mils (0.13 mm). ASTM D7466 is identical to GRI-GM12.
2. Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.

* All values are nominal test results, except when specified as minimum or maximum.
* The information contained herein is provided for reference purposes only and is not intended as a warranty of guarantee. Final determination of suitability for use contemplated is the sole responsability of the user. SOLMAX assumes no liability in connection with the use of this information.

SOLMAX INTERNATIONAL
2801, Boul. Marie-Victorin
Varennes, Quebec, Canada, J3X 1P7
Tel.: 1-450-929-1234
Tel.: 1-800-571-3904
Fax: 1-450-929-2547

List of Geomembrane Rolls

MF-CQ-01
Rev. 05/ 21 mars 2006

Solmax ACCEPTÉ/ACCEPTED Quality Department

Project Name : SOUTH PLAINFIELD, NJ

Project Number : 7073

Reference Number : 104818

Invoice Number : 210257

Roll Number	Product Code	Resin Lot Number	Manufactured Date	SP-NCTL ASTM D5397 (hr) Specification	Result	Roll Tested
2-59453	Solmax 440-1000	11H1298	13-déc-11	>400	500	2-59428

Quantity (rolls) : 1

Resin Certification

Resin Lot	Melt index ASTM D1238 g/10min	Density ASTM D1505 g/cc	OIT ASTM D3895 min	HP-OIT ASTM D5885 min
11H1298	0.070	0.937	120	N/A

Formosa Plastics

FORMOSA PLASTICS CORPORATION, TEXAS
201 FORMOSA DRIVE
PO BOX 700
POINT COMFORT TX 77978
PHONE:(888)FPCUSA3

Certificate of Analysis

CUSTOMER:SOLMAX INTERNATIONAL INC.
2801 MARIE-VICTORIN

VARENNES QC J3X 1
PRODUCT :DF3812A
RAILCAR FPAX980250

S/O NO : EL9A708
CUSTOMER PO : 108042-0
DATE SHIPPED: 10/24/11
LOT NO : 11H1298
WEIGHT : 196,750.00
CUSTID:FT03828 SPIDE3

TEST ITEM	REFERENCE METHOD	TEST VALUE
Melt Index,g/10min	ASTM D1238	.070
HLMI, g/10 min.	ASTM D1238	10.2
Density, g/cm3	ASTM D1505	.9373

Notes:
* OIT AT 200 DEGREES C IS GREATER THAN 120 MINUTES

Chantal Gagnon
2011.11.04 14:05:32 -04'00'

Linda Kao

QC SUPERVISOR: LINDA KAO

SOLMAX
INTERNATIONAL
2801, Boul. Marie-Victorin
Varennes, Quebec, Canada, J3X 1P7
Tel.: 1-450-929-1234
Tel.: 1-800-571-3904
Fax: 1-450-929-2547

Manufacturing Quality Control Test Results - Rolls

MF-CQ-11
Rev. 04/ 10-12-04

Product : Solmax 440-1000

Project Name : SOUTH PLAINFIELD, NJ
Project Number : 7073
Ref. Number : 104818 *Invoice Number :* 210257

Solmax ACCEPTE / ACCEPTED Chantal Gagnon Quality Department

Properties		Thickness ave / min.	Geomembrane Density	Carbon Black Content	Carbon Black Dispersion	Yield Strength	Yield Elong.	Break Strength	Break Elong.	Tear Resistance	Puncture Resistance	Dimension. Stability	Asperity Height in / out
Unit		mils	g/cc	%	Cat. 1 and Cat. 2	ppi	%	ppi	%	lbs	lbs	%	mils
Test Method		D5199	D1505/D792	D4218	D5596	D6693 Résistance tension (D 638, Type IV)				D1004	D4833	D1204	
Frequency		Each roll	1/2 ro	1/2 ro	1/6 ro	1/2 ro				1/6 ro	1/6 ro	1/6 ro	N/A
Specification		40 / 36	> 0.94	> 2.0 / < 3.0	Cat. 1 _Cat. 2	84	13	162	700	28	80	± 2	
2-59453	MD	41 / 41	0.946	2.6	10 /10 Views	102.8	19.8	216	807	37.2	118.8	-0.45	/
	XD					111.9	15.0	219	903	33.4		0.09	

SOLMAX
INTERNATIONAL

Solmax International Inc.
2801, Boul. Marie-Victorin
Varennes, Quebec, Canada, J3X 1P7

Tel.: 1-800-571-3904 Fax: 1-450-929-2547

List of Geomembrane Rolls

MF-CQ-01 Rev 06/ 2011-12-23

Solmax ACCEPTÉ/ACCEPTED Chantal Gagnon Quality Department

Project Name : SOUTH PLAINFIELD, NJ

Project Number : 7086

Reference Number : 104875

Invoice Number : 210337

Roll Number	*Product Code*	*Resin Lot Number*	*Manufactured Date*	Resin Melt Index 190/2.16 g/10 min D1238	Resin Density g/cc D1505	OIT *Spec* min D3895	OIT Result min D3895	HPOIT *Spec* min D5885	HPOIT Result min D5885	ESCR SP-NCTL *Spec* hours D5397	ESCR SP-NCTL Roll Tested hours D5397
2-60554	Solmax 440-1000	8210746	27-janv-12	0.15	0.935	*100*	182			*>400*	2-60506 PASS

Quantity (rolls) : 1

SOLMAX INTERNATIONAL

Solmax International Inc.
2801, Boul. Marie-Victorin
Varennes, Quebec, Canada, J3X 1P7

Tel.: 1-800-571-3904 Fax: 1-450-929-2547

Manufacturing Quality Control

MF-CQ-11 Rev. 05/2011-12-23

Test Results - Rolls

Solmax ACCEPTED/ACCEPTED Claude Gagnon Quality Department

Project Name : SOUTH PLAINFIELD, NJ

Project Number : 7086

Reference Number : 104875

Invoice Number : 210337

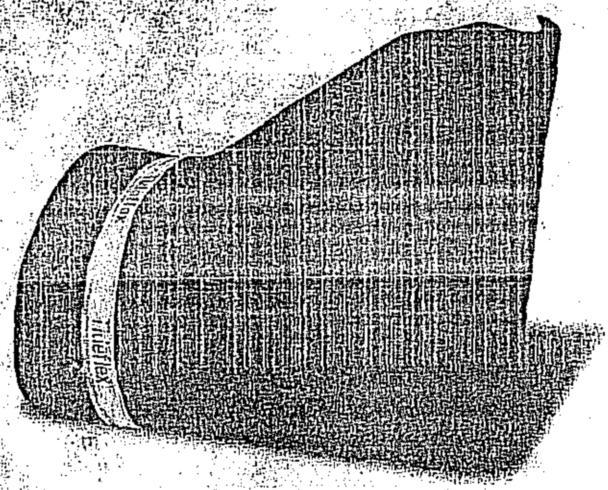
Product : Solmax 440-1000

Properties	Thickness ave / min.	Geo-membrane Density	Carbon Black Content	Carbon Black Dispersion	Tensile Yield Strength	Tensile Yield Elong.	Tensile Break Strength	Tensile Break Elong.	Tear Resist.	Puncture Resist.	Dimension. Stability	Asperity Height in / out
Unit	mils	g/cc	%	Cat. 1 and 2	ppi	%	ppi	%	lbs	lbs	%	mils
Test Method	D5199	D1505/D792	D4218	D5596	D6693				D1004	D4833	D1204	
Frequency	Each roll	1/2 ro	1/2 ro	1/6 ro	1/2 ro				1/6 ro	1/6 ro	1/6 ro	N/A
Specification	40 / 36	> 0.94	> 2.0 / < 3.0	Cat. 1 - Cat. 2	84	13	162	700	28	80	± 2	
2-60554 MD	41 / 39	0.949	2.9	10 /10	98.0	19.7	211	877	33.3	108.2	-0.53	/
XD				Views	103.3	16.4	215	968	30.6		0.05	

Tideflex Technologies
Division of Red Valve Inc.

TIDEFLEX® TF-1 AND TF-2 ALL-RUBBER CHECK VALVES

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL


TF-1


TF-2

The revolutionary design of the all rubber Tideflex® Check Valve provides reliable backflow protection. This unique "duck bill" design eliminates costly back-flow from oceans, rivers or storm water and is the ideal valve for effluent diffuser systems.

Tideflex® Valves seal on entrapped solids and debris without jamming. Unlike traditional flap gates there are no hinged gates to hang open and no warping or freezing. It's virtually maintenance-free.

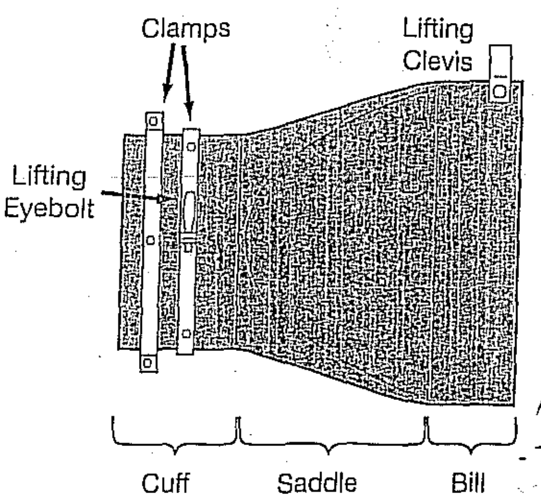
The Tideflex® Check Valve is available in a wide variety of elastomers and is designed to meet your exact flow specifications.

IMPORTANT
Please take a moment to **review this manual. Before performing any maintenance on the valve be sure the pipeline has been de-pressurized.** The improper installation or use of this product may result in personal injury, product failure, or reduced product life. Tideflex® Technologies can accept NO liability resulting from the improper use or installation of this product. If you have any questions or problems, please call the customer service department at (412) 279-0044. We appreciate your comments. Thank you for choosing Tideflex® Technologies.

GENERAL DESCRIPTION

The Tideflex® Technologies' Tideflex® Check Valve is an all-elastomer, one-piece check valve. Terms used in this I.O.M. to refer to various parts of the valve are described below.

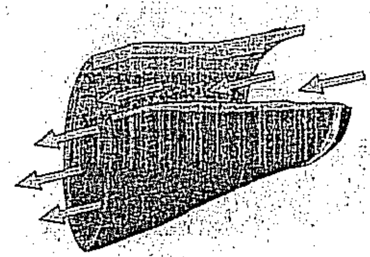
1. **Cuff** The Cuff is designed with a full round bore and slips over the end of the pipe.
2. **Saddle** The Saddle is the middle part of the valve, tapering from the round cuff to the flat bill. The Saddle directs the flow to the bill, and is flexible to sustain increased flow conditions.
3. **Bill** The Bill is the discharge end of the valve. The Bill flexes to allow flow to discharge, yet is stiff enough to prevent the valve from opening without line pressure. Back pressure – pressure created on the exterior of the valve by reverse flow or submersion – will seal the lips of the bill tightly together, preventing backflow into the valve.
4. **Clamps** The clamps are tightened around the Cuff after the Cuff has been slipped over the end of the discharge pipe. These clamps are normally furnished by Red Valve Company, Inc. Hose clamps are supplied for valves up to 12". Valves 14" and up are supplied with fabricated clamps. 14"-20" are supplied with one set, 20"-54" are supplied with two sets and sizes 60" and up are supplied with three sets.
5. **Lifting Clevis** A lifting clevis is attached to the Bill of the Check Valve for valves 36" and up. This clevis is used during installation to assist in lifting the valve, and may be used to attach a line to the bill to help support the valve after installation.



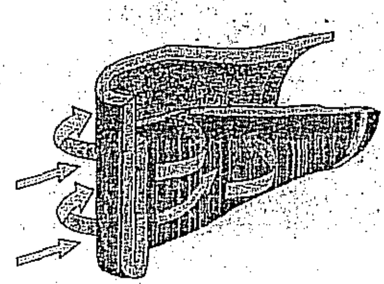
OPERATION

Tideflex® Check Valves are custom made products intended for a specific application and have been designed to respond to criteria unique to that purpose, such as line pressure, minimum and maximum back pressure and chemical compatibility. Should the conditions for which the valve has been designed be altered or change in any way, it could affect the normal operation of the valve.

Tideflex® Check Valves work on backpressure exerted on the bill area to seal the valve. The bill may appear to be slightly open when installed. This slight opening does not affect the operation of the valve, as the valve depends on backpressure to seal.



Forward Pressure Opens Valve



Reverse Pressure Seals Valve

NEVER... Cut or modify check valve.

DO... Use a soapy water solution to slide Tideflex® on pipe.

DO... Keep valve on pallet until ready to install.

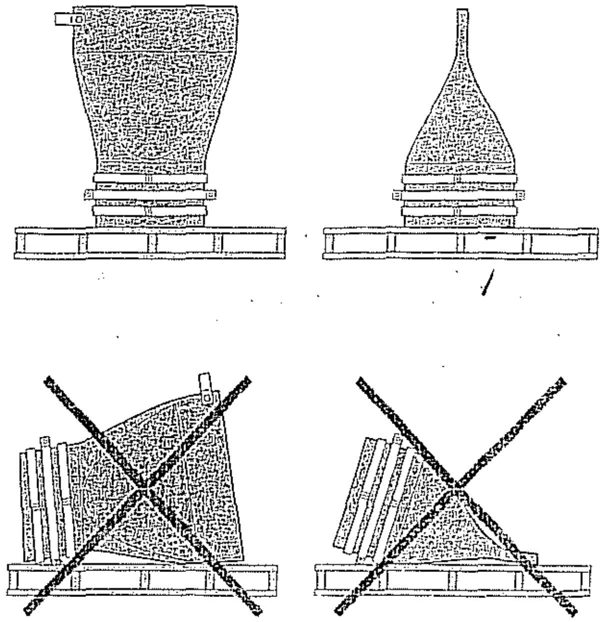
DO... Tighten clamp bolts evenly.

STORAGE

Tideflex® Check Valves should be stored in a cool, dry location on original shipping pallet with the bill facing upward (not on side) (Figure # 2). Do not drop, bend or twist Check Valve or damage may occur.

1. Store valve in a cool, clean, dry location.
2. Avoid exposure to light, electric motors, dirt or chemicals. Resilient Check Valves are subject to deterioration when exposed to ozones and non-compatible chemicals. Ozone especially causes age hardening of the elastomer.
3. Store Installation Operation Manual with pro-duct so it will be readily available for installation.
4. Do not remove wooden brace or metal "shipping ring" (36"+) until valve is installed.

FIGURE 2



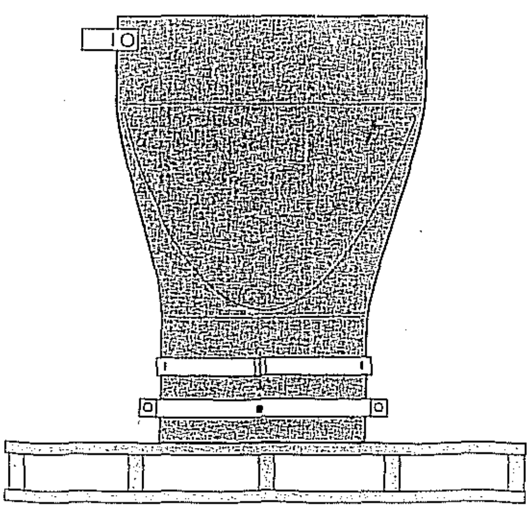
NEVER STORE HORIZONTALLY

INSTALLATION INSTRUCTIONS – LARGE DIAMETER TIDEFLEX® CHECK VALVES 24" AND OVER

1. INSPECTION OF CHECK VALVE:

Check the inside diameter of the Cuff of the Tideflex® Check Valve to compare it to the O.D. of the outfall pipe. Inspect the outfall pipe for sharp or damaged areas. The Pipeline should be in a smooth condition to prevent cutting the Rubber Check Valve. Lifting clevis and Lifting Eye Bolts are provided only for sizes 36" vided only for sizes 36" and over.

Imperfections on the inside of the cuff area can be filled with a silicone sealant prior to installing the valve on the pipe. This will ensure a seal in the cuff area after clamps are tightened.

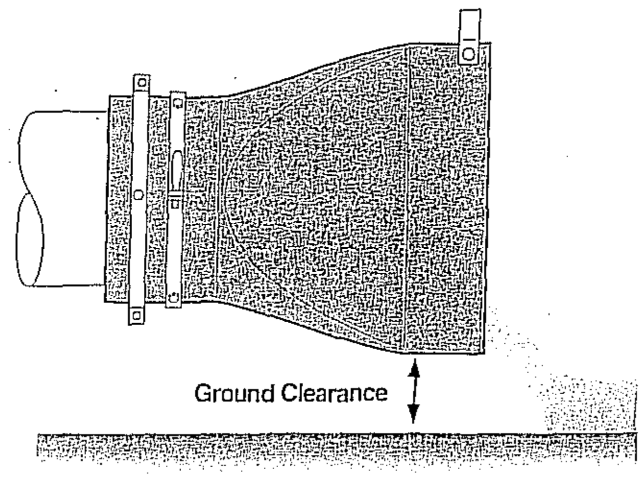


2. INSPECTION OF THE PIPE

Check the outside diameter of the pipe to determine if it matches the I.D. of the Cuff of the Tideflex® Check Valve. The Cuff of the Check Valve is usually made slightly larger to permit ease of installation.

3. CLEARANCE

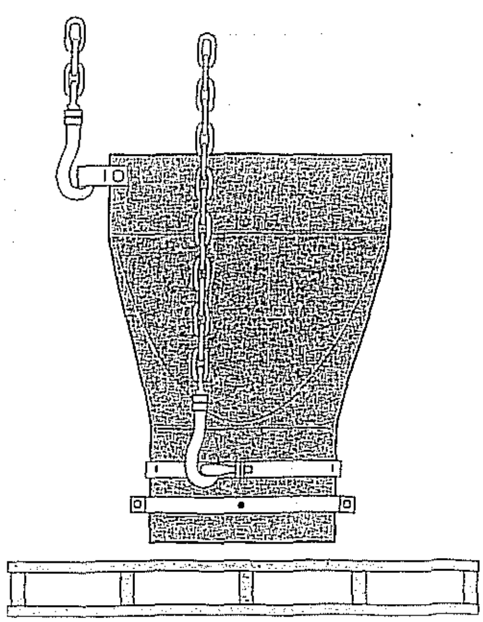
Make certain that sufficient ground clearance exists below the valve, at least 10% of the valve diameter. (I.E. 6" for a 60" valve)



IMPORTANT

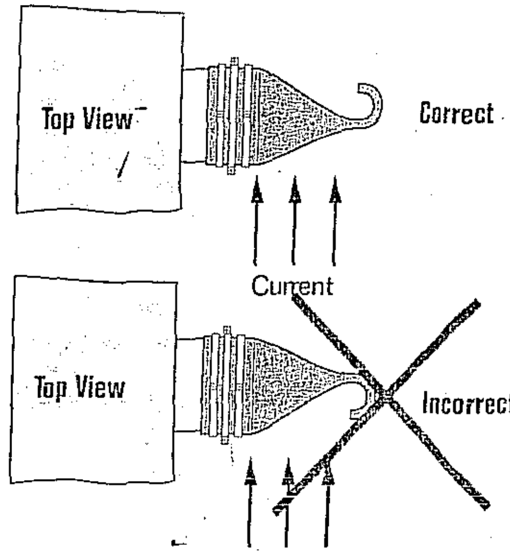
5. REMOVING THE VALVE FROM PALLET OR CRATING

A lifting clevis is provided at the top end of the Tideflex® Check Valve. Lifting eye bolts are provided on the clamps. Remove the cuff retainer "Shipping Ring" or wooden brace located inside the Cuff of the valve. The valve should be lifted from the pallet using both the clevis and the lifting eye bolts.



4A. TIDEFLEX® WITH CURVED BILL INSTALLATION IN CURRENT

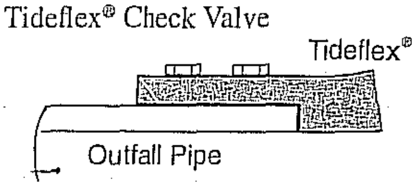
For Tideflex® fabricated with a curved bill, the valve should be installed so the bill points in the direction of the current, not facing the current which may cause the bill to be forced open.



4B. FITTING TIDEFLEX® ON PIPE

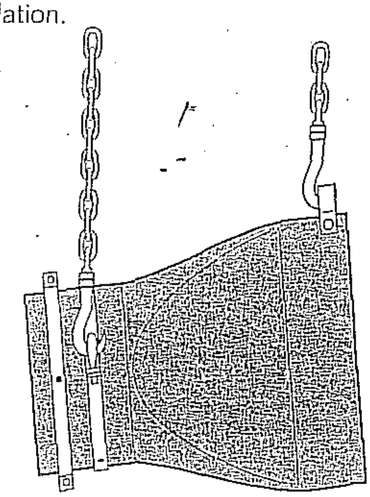
A. To facilitate the insertion of the pipe into the Tideflex® Check Valve, it might be necessary to grind a bevel on the inside cuff diameter.

B. Sometimes it is necessary to grind the inside of the cuff or add gasket material to the O.D. of the pipe to properly fit the Tideflex® Check Valve



6. LIFTING THE VALVE

Do not discard the metal clamps holding the valve onto the pallet; THESE CLAMPS ARE NEEDED to install the Tideflex® Check Valve. In lifting the Tideflex® Check Valve from the pallet, keep the bill end of the Tideflex® higher than the cuff for ease of installation.



7. POSITIONING THE VALVE

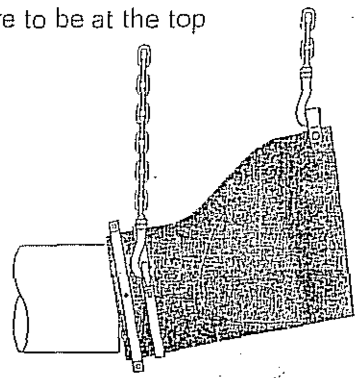
Apply a soap/water solution to the outside of the pipe in which the check valve is being installed on, to ease installation.

TF-2

With the bill end of the Tideflex® lifted higher than the cuff end start to fit cuff on the outfall line. The Tideflex® Check Valve should fit snugly against the outfall pipe, leaving no gap.

TF-1

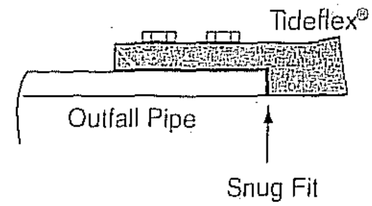
Flat portion of the valve to be at the bottom of the pipe. Flare to be at the top

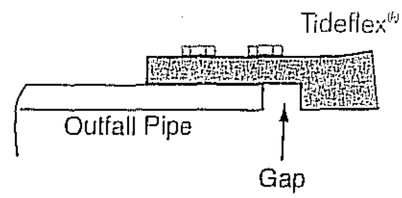


After the unit is securely pegged into position, proceed to install and tighten the first clamp. A mild lubricant may be applied to the I.D. of the **clamp** to prevent a brake shoe effect when tightening down clamps.

8. SEAT TIDEFLEX® ON PIPE

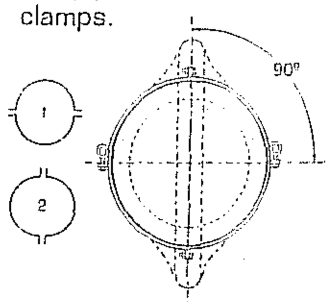
The Tideflex® Check Valve should fit snugly against the outfall pipe, leaving no gap. If possible, inspect installation from the inlet end of the Tideflex® Check Valve to insure that the Check Valve Cuff fits snugly on the pipe. Do not allow a gap between the cuff and the end face of the outfall pipe. A gap will create an imbalance which will not provide proper support for the Tideflex® Check Valve. For more information, see troubleshooting.

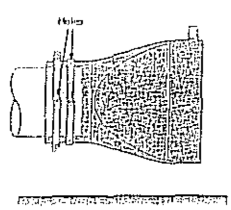




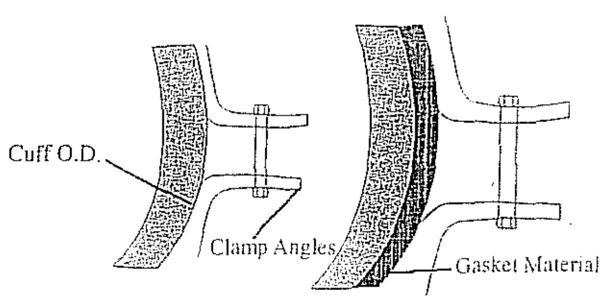
9. POSITIONING FOR 2 CLAMPS

Install the second clamp on the cuff of the Tideflex®. Rotating the clamp 90° in relation to the first clamp will ensure even pressure around the valve and pipe, thus increasing the effectiveness of the clamps.





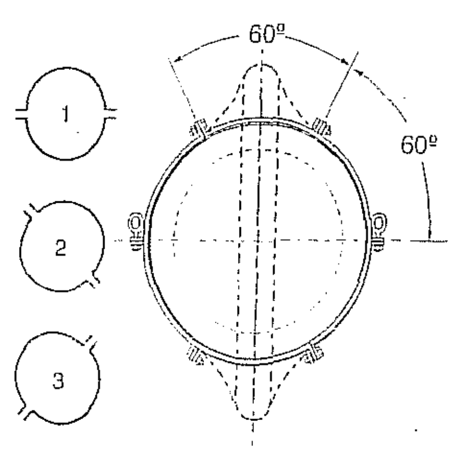
If a greater distance between the "angles" of the clamps is required to provide more range for tightening the bolts (especially if angles are bottoming out), gasket material can be wrapped around the OD of the cuff as shown.



10. POSITIONING FOR 3 CLAMPS

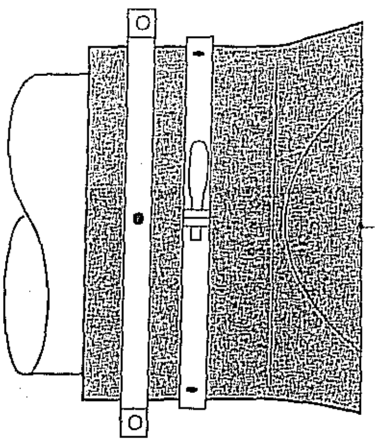
After the unit is securely pegged into position, proceed to install and tighten the first clamp. A mild lubricant may be applied to the I.D. of the **clamp** to prevent a brake shoe effect when tightening down clamps.

Install the second and third clamps on the cuff of the Tideflex®. Rotating the first and second clamps 60° and 120°, respectively, in relation to the first clamp will ensure even pressure around the valve and pipe, thus increasing the effectiveness of the clamps.



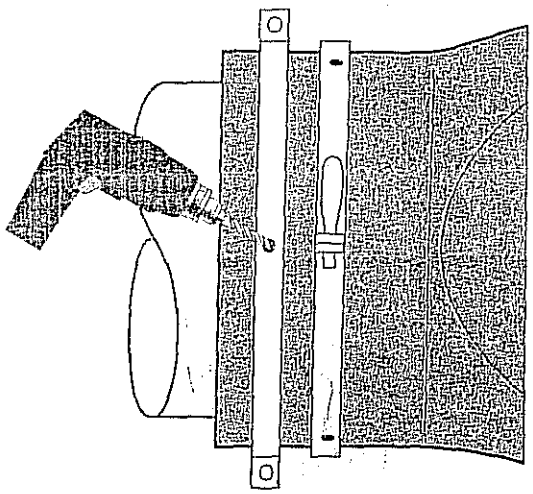
11. POSITIONING BLANK HOLES IN CLAMPS

Tighten all clamps and bolts once all components have been positioned properly. Pre-drilled holes are drilled in each clamp. These are provided so as to secure the Tideflex® Check Valve with "holding pins" to the outfall pipe. This will secure the Tideflex® Check Valve to the pipe and assure a long, trouble-free service life. After tightening the clamps, the pre-drilled holes should be staggered. Holes are not drilled in the rubber cuff of the Tideflex® at the factory since they would **not** line up to the tightened clamps.



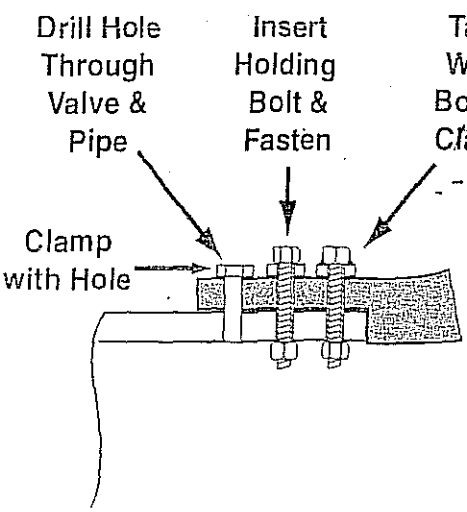
12. TACK WELDING HOLDING BOLTS TO CLAMPS

Once clamps are secure use a standard steel drill bit and drill holes through the rubber cuff. Insert holding bolts through the cuff and secure opposite side with nut, if possible. Holding bolts should be stainless steel. **Steel bolts can corrode and break off, causing the Check Valve to slip off the pipe.** Holding bolts are not provided because of various widths of the outfall pipe.



13. BOLTS TACK WELDED TO CLAMPS

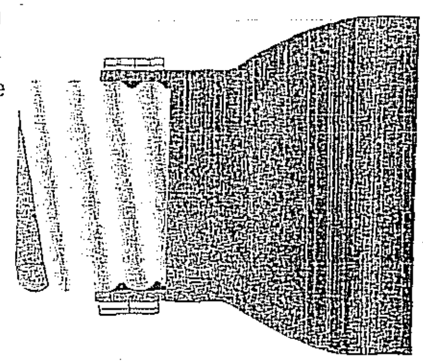
After tightening, heads of holding bolts can be tack welded to the clamps using small tacks. Certain installations will not permit installing of nuts to bolts. In these situations, the tightness of the clamps and tack weld of the bolts will assure good support.



14. CORRUGATED PIPE AND SMOOTH WALL (PVC, HDPE) PIPE INSTALLATION

For installation on corrugated pipe it is recommended that the corrugations be filled with hydraulic cement (or similar material) that will provide a smooth O.D.

For smooth wall pipe it is recommended that the valve be pinned.



TROUBLESHOOTING

Valve will not fit to pipe

- Make certain that the inside cuff retainer ring has been removed prior to fitting the valve to the pipe.
- Verify that the valve has enough area to fit over the pipe.
- If the pipe can be removed, or if an adapter ring which bolts to the wall or inside a vault is used, a crane or high-lift may be used to lower the valve onto the ring with the valve turned on end and the bill facing up.

Valve will not close fully, or check flow in opposing direction

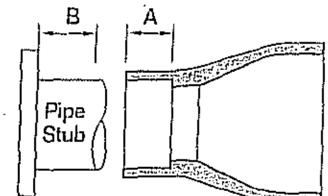
- Possible obstruction in line. Inspect the valve for entrapped foreign objects which may have lodged between the lips of the valve.
- Valve may not be installed high enough to clear the ground under the bill. Ensure that there is enough space between the bottom of the valve and the ground in order to prevent contact of the two or debris build-up.
- Back-pressure may not be sufficient to completely seal the valve.
- The Valve may not have been installed in a vertical position.

Valve will not stay on pipe

- Check all clamp bolts to assure that all bolts are tightened sufficiently.
- Valve may not be fully seated onto outfall line.
- Clamps are not rotated 90° from each other in order to provide adequate holding power.
- Valve cuff has a much larger I.D. in relation to pipe O.D.
- Make sure holding pins are used on 42" and larger Check Valves in order to prevent the valve from slipping off the line.

TF-2 Check Valves are designed to slide over a pipe stub. Too short of a pipe stub may cause the Check Valve to slip off or cause the Check Valve to gap open.

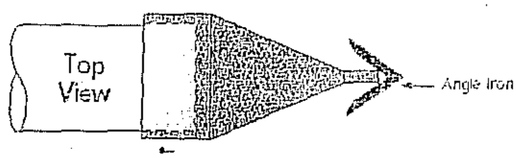
For valves up to 4", the pipe stub length "B" should be a minimum of 1/2" longer than cuff depth "A".

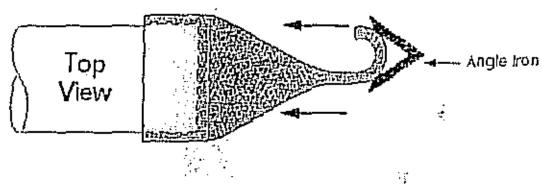


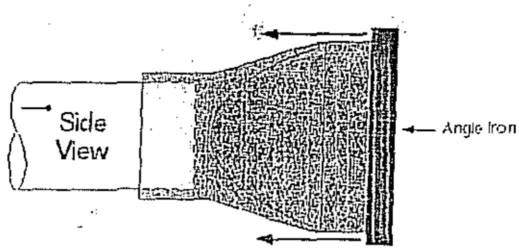
6"-14"	1" longer
16"-24"	2" longer
30"-60"	2 1/2" longer
72" and up	3" longer

*** Hints to install large diameter check valves**

During the installation of the check valve, if force is needed to seat the valve to the cuff stop on large diameter check valves, the force required should be induced equally around the cuff of the check valve, never at only the top, bottom or in the center. The force required to push the check valve onto the pipe can be placed on the bill but it should be distributed evenly over the entire length of the bill. Failure to distribute the pressure equally may cause improper performance of the check valve. Use a wide angle iron or large wooden planks across the bill to distribute the force equally.







MAINTENANCE

Line pressure should flush the valve clean of debris in most cases. Periodic inspections for trapped debris should be conducted.

In vacation seashore areas quart size plastic bottles have a tendency to float on top and not flush through except during a major storm.

A feathered 1" x 4", 1-1/2" x 12", or suitable plank inserted into the bill of the valve and turned 90° is a simple method of clearing the Check Valve of small debris which may be trapped between the lips.

CAUTION: Sharp objects should not be used on the Tideflex® as there is a chance of cutting the rubber and damaging the protective fabric covering.

Any gouges in the cover wrap that occur should be sealed to safeguard against ozone or chemical attack. This is best done with rubber cement or a good brand of silicone or polyurethane rubber sealer made by the major manufacturers.

Tideflex® Technologies Warranty

WARRANTIES - REMEDIES - DISCLAIMERS - LIMITATION OF LIABILITY

Unless otherwise agreed to in writing signed by Tideflex® Technologies, all Products supplied by Tideflex® Technologies will be described in the specifications set forth on the face hereof.

THE WARRANTIES SET FORTH IN THIS PROVISION ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER STATUTORY, EXPRESS OR IMPLIED (INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ALL WARRANTIES ARISING FROM COURSE OF DEALING OR USAGE OR TRADE).

Tideflex® Technologies Products are guaranteed for a period of one year from date of shipment, against defective workmanship and material only, when properly installed, operated and serviced in accordance with Tideflex® Technologies' recommendations. Replacement for items of Red Valve's manufacture will be made free of charge if proved to be defective within such year; but not claim for transportation, labor or consequential damages shall be allowed. We shall have the option of requiring the return of the defective product to our factory, with transportation charges prepaid, to establish the claim and our liability shall be limited to the repair or replacement of the defective product, F.O.B. our factory. Tideflex® Technologies will not assume costs incurred to remove or install defective products nor shall we incur backcharges or liquidated damages as a result of warranty work. Tideflex® Technologies does not guarantee resistance to corrosion erosion, abrasion or other sources of failure, nor does Tideflex® Technologies guarantee a minimum length of service, or that the product shall be fit for any particular service. Failure of purchaser to give prompt written notice of any alleged defect under this guarantee forthwith upon its discovery, or use, and possession thereof after an attempt has been made and completed to remedy defects therein, or failure to return product or part for replacement as herein provided, or failure to install and operate said products and parts according to instructions furnished by Tideflex® Technologies, or failure to pay entire contract price when due, shall be a waiver by purchaser of all rights under these representations. All orders accepted shall be deemed accepted subject to this warranty which shall be exclusive of any other or previous warranty, and shall be the only effective guarantee or warranty binding on Tideflex® Technologies, anything on the contrary contained in purchaser's order, or represented by any agent or employee of Tideflex® Technologies in writing or otherwise, not withstanding implied warranties. Tideflex® Technologies MAKES NO WARRANTY THAT THE PRODUCTS, AUXILIARIES AND PARTS ARE MERCHANTABLE OR FIT FOR ANY PARTICULAR PURPOSE.

Tideflex
Technologies
700 North Bell Avenue
Carnegie, PA 15106
phone: 412 279-0044
fax: 412 279-7878
WEB: www.tideflex.com

APPENDIX G

APPENDIX G

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

INSPECTION BEING CONDUCTED:

QUARTERLY ✓ ANNUALLY ___ AFTER 1" or GREATER RAINFALL ___ /2 [illegible]

AFTER 1.25" IN 2 HOUR STORM EVENT ___ UNDER SPECIAL CIRCUMSTANCES ___

Inspection Date: 1/7/13 Weather: Light Rain

Inspector's Name: Perry Novak

"BASIN" Inspection:

Catch Basins (23 Structures):

	Yes	No	N/A
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment, and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins? If yes, which catch basin(s)? ___ (Refer to Record Drawings for catch basin numbers)		X	

Stormwater Detention Basin and Surface Sand Filter:

	Yes	No	N/A
5. Does the basin have pooled or standing water? If yes, describe where: ___		X	
6. What is the water height? None			
Approximately how many hours ago was the last rainfall? ___			
How many inches of rain? ___			
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin? If yes, describe where: ___		X	
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?		X	

APPENDIX G
Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

INSPECTION BEING CONDUCTED:

QUARTERLY X **ANNUALLY** ___ **AFTER 1" or GREATER RAINFALL** ___

AFTER 1.25" IN 2 HOUR STORM EVENT ___ **UNDER SPECIAL CIRCUMSTANCES** ___

Inspection Date: 10/30/13 Weather: Cloudy 55°

Inspector's Name: William Zamorana

"BASIN" Inspection:

	Yes	No	N/A
Catch Basins (23 Structures):			
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment, and debris?	X		
3. Has vegetation been removed from all catch basin areas?	X		
4. Are there any signs of damage or deterioration of catch basins? If yes, which catch basin(s)? ___ (Refer to Record Drawings for catch basin numbers)		X	
Stormwater Detention Basin and Surface Sand Filter:			
5. Does the basin have pooled or standing water? If yes, describe where: ___		X	
6. What is the water height? ___ Approximately how many hours ago was the last rainfall? ___ How many inches of rain? ___			
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin? If yes, describe where: ___		X	
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?	X		

APPENDIX G
Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

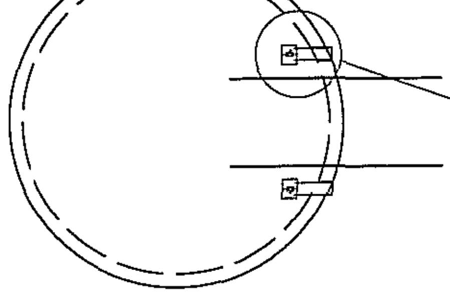
	Yes	No	N/A
Inlet and Outlet Structures:			
11. Are the five inlet and four outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where: ______		X	
13. Are the inlets clear of trash, sediment, and debris?	X		
14. Are the outlets (standpipe, 3" orifice, secondary outlet, and emergency spillway) clear of trash, sediment, and debris?	X		
15. Are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where: ______		X	
16. Has vegetation been removed from the inlets and outlets?	X		

Additional descriptions of where repairs or maintenance is needed:

- CB-12: INSTALLED SEEP Holes To Drain THE AREA OF THE CONTAINMENT LINER FOR THE STorm Drain System (ATTACHED ARE A Drawing AND photograph)
- Repair Fence IN THE NorThEAST Corner of site.
- THEIR will be 7 GATES ON THE ENTIRE site THAT will be changed To a UNIVERSAL Lock system with 1 Key entry.
- Remove all Debris by Fences.
- THERE'S A hole by THE FENCE FOR easy ACCESS of mail ON HAMILTON Blvd.
- CUT ANY Tree limbs THAT my DAMAGE Fence
- Secure The well CAP INSIDE THE CATCH BASIN.

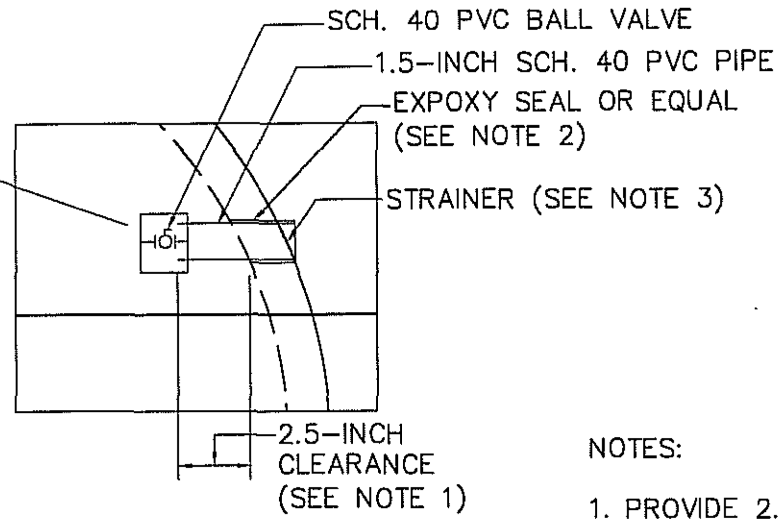
Inspector's Signature

User: lamiceli Spec: PIRNIE STANDARD File: I:\ACAD\PROJ\4553033\6-26-13\FIGURE 1.DWG Scale: 1:1 Date: 06/26/2013 Time: 1



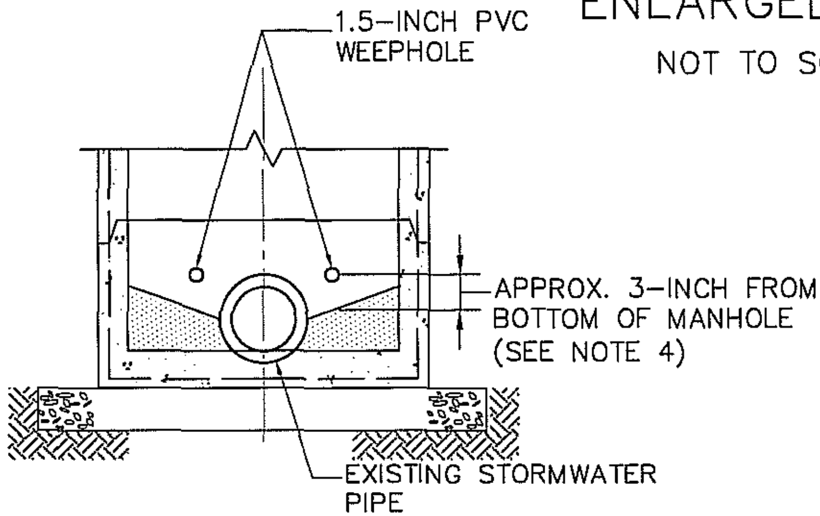
PLAN VIEW

NOT TO SCALE



ENLARGED VIEW

NOT TO SCALE



SECTION VIEW

NOT TO SCALE

NOTES:

1. PROVIDE 2.5–INCH CLEARANCE OF PVC PIPE TO INSTALL 1.5–INCH PVC SLIP BALL VALVE. THREAD CONNECTION PREFERRED.
2. THE ANNULAR SPACE BETWEEN THE PVC PIPE AND THE CONCRETE MANHOLE SHALL BE SEALED WITH POLYURETHANE INJECTION GROUT, EPOXY OR EQUAL TO PROVIDE A TIGHT SEAL.
3. PROVIDE A STAINLESS STEEL 30 MESH (1/64th INCH) LINE STRAINER OR EQUAL THAT FITS OVER 1.5–INCH NPT.
4. LOCATION OF WEEP HOLES TO BE COORDINATED IN THE FIELD WITH THE ENGINEER. WEEP HOLES TO BE SITUATED AT LOWEST ELEVATION POSSIBLE WHILE ALLOWING SUFFICIENT OPERATION OF THE BALL VALVE.
5. PVC VALVE TO CONSIST OF THE FOLLOWING (OR EQUAL):
   - PVC SCHEDULE 40 BALL VALVE WITH SWING HANDLE
   - THREADED CONNECTION

Approved	Date	Description	Symbol

Revisions

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
KANSAS CITY DISTRICT
KANSAS CITY, MISSOURI

MALCOLM PIRNIE

MALCOLM PIRNIE, INC.
44 SOUTH BROADWAY
WHITE PLAINS, NY 10601

Designed by: JTS	Date: 06/26/13	Approved by:	Date:
Drawn by: KBI	Date: 06/26/13	File Name:	
Reviewed by: JTS	Date: 06/26/13		

CORNELL–DUBILIER ELECTRONICS
SUPERFUND SITE OU–2 SOILS REMEDIATION
SOUTH PLAINFIELD, NEW JERSEY

BALL VALVE INSTALLATION PLAN

FIGURE 1

CB-12

APPENDIX G
Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

"Pavement" Inpsection (Part of Annual Inspection):

	Yes	No	N/A
1. Is there any standing water? If yes, describe where: ______		X	
2. Are there any signs of cracking? If so, note location and maintenance effort below.	X		
3. Are there any signs of disintegration? If so, note location and maintenance effort below.		X	
4. Are there any signs of distortion? If so, note location and maintenance effort below.		X	
5. Has all vegetation been removed? If applicable, note location of vegetation below.	X		
6. Has the usage of the Site increased to a point that warrants a Pavement Condition Index (PCI) survey?		X	
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied? When was the date of the last CPM treatment? ______ (Refer to Section 2.2.3 of the Operation & Maintenance Manual)		X	

Additional descriptions of where repairs or maintenance is needed:

- ON THE North EAST Corner of The site, THERE ARE cracks ON THE surface of The AsphalT Due To Heavy MoisTure IN THE Area before THE initial placement of AsphalT. THE CAP WAS INTacT AND AS such, NO repairs required.
- Fire Hydrants ON-SITE ARE NOT FuncTional. LINE From meter To Hydrant require repair IF needed at a later Date. THE meter is shut-off to hydrants which must be checked For proper operation at a lator Date.

Inspector's Signature

APPENDIX G
Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

"Tree Grove" Inspection:

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe: ______	☐	☒	☐
2. Is there an accumulation of tree debris? If yes, describe: ______	☐	☒	☐
3. Do any trees appear infested? If yes, describe: ______	☐	☒	☐
4. Do any trees appear malnourished? If yes, describe: ______	☐	☒	☐
5. Was the last Quarterly Seasonal Maintenance performed? Date of previous maintenance: ______ (Refer to Section 2.3.2 of the Operation & Maintenance Manual)	☐	☐	☒
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: ______ (Refer to Section 2.3.3 of the Operation & Maintenance Manual)	☐	☐	☒

Additional descriptions of where repairs or maintenance is needed:

USEPA/USACE requested THAT the grove area HAVE an overgrowth.

Inspector's Signature

APPENDIX G

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

INSPECTION BEING CONDUCTED:

QUARTERLY X ANNUALLY ___ AFTER 1" or GREATER RAINFALL ___

AFTER 1.25" IN 2 HOUR STORM EVENT ___ UNDER SPECIAL CIRCUMSTANCES ___

Inspection Date: 10/1/13 Weather: Sunny

Inspector's Name: William Zambrana

"BASIN" Inspection:

	Yes	No	N/A
Catch Basins (23 Structures):			
1. Are catch basins properly draining?	✓		
2. Are the catch basins clear of trash, sediment, and debris?	✓		
3. Has vegetation been removed from all catch basin areas?	✓		
4. Are there any signs of damage or deterioration of catch basins? If yes, which catch basin(s)? ______ (Refer to Record Drawings for catch basin numbers)		✓	
Stormwater Detention Basin and Surface Sand Filter:			
5. Does the basin have pooled or standing water? If yes, describe where: ______		✓	
6. What is the water height? ______ Approximately how many hours ago was the last rainfall? ______ How many inches of rain? ______			
7. Does the bottom appear relatively flat? No sand has washed away?	✓		
8. Are concentrated flows of runoff being unexpectedly directed into the basin? If yes, describe where: ______		✓	
9. Is there any damage to the sand bed or berms?		✓	
10. Has vegetation been removed from the basin areas?	✓		

APPENDIX G

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

	Yes	No	N/A
Inlet and Outlet Structures:			
11. Are the five inlet and four outlet structures draining properly?	☑	☐	☐
12. Is there any standing water? If yes, describe where: ____________	☐	☑	☐
13. Are the inlets clear of trash, sediment, and debris?	☑	☐	☐
14. Are the outlets (standpipe, 3" orifice, secondary outlet, and emergency spillway) clear of trash, sediment, and debris?	☑	☐	☐
15. Are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where: ____________	☐	☑	☐
16. Has vegetation been removed from the inlets and outlets?	☑	☐	☐

Additional descriptions of where repairs or maintenance is needed:

____

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Inspector's Signature

APPENDIX G

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

"Tree Grove" Inspection:

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe: ______	☐	☑	☐
2. Is there an accumulation of tree debris? If yes, describe: ______	☐	☑	☐
3. Do any trees appear infested? If yes, describe: ______	☐	☑	☐
4. Do any trees appear malnourished? If yes, describe: ______	☐	☑	☐
5. Was the last Quarterly Seasonal Maintenance performed? Date of previous maintenance: ______ (Refer to Section 2.3.2 of the Operation & Maintenance Manual)	☐	☐	☑
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: ______ (Refer to Section 2.3.3 of the Operation & Maintenance Manual)	☐	☐	☑

Additional descriptions of where repairs or maintenance is needed:

USEPA/USACE requested that The grove area HAVE an Overgrowth.

____
Inspector's Signature

APPENDIX G

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

"Pavement" Inpsection (Part of Annual Inspection):

	Yes	No	N/A
1. Is there any standing water? If yes, describe where: ______________________________	✓		
2. Are there any signs of cracking? If so, note location and maintenance effort below.	✓		
3. Are there any signs of disintegration? If so, note location and maintenance effort below.	✓		
4. Are there any signs of distortion? If so, note location and maintenance effort below.	✓		
5. Has all vegetation been removed? If applicable, note location of vegetation below.	✓		
6. Has the usage of the Site increased to a point that warrants a Pavement Condition Index (PCI) survey?		✓	
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied? When was the date of the last CPM treatment? __________ (Refer to Section 2.2.3 of the Operation & Maintenance Manual)		✓	

Additional descriptions of where repairs or maintenance is needed:

Small Ponding area around site: 3 in the N.E Area,
1 at SW of water Tower, 1 at N.E. of Gate measure.
- Disintergration at N.E corner by South Entrance gate
- Disintegration at S.E. area by manhole 13A

____

Inspector's Signature

APPENDIX G
Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

INSPECTION BEING CONDUCTED:

QUARTERLY ✓ **ANNUALLY** ___ **AFTER 1" or GREATER RAINFALL** ___

AFTER 1.25" IN 2 HOUR STORM EVENT ___ **UNDER SPECIAL CIRCUMSTANCES** ___

Inspection Date: 8/29/13 Weather: PARTLY CLOUDY

Inspector's Name: William ZAMBRAN, Kim Lickfield

"BASIN" Inspection:

	Yes	No	N/A
Catch Basins (23 Structures):			
1. Are catch basins properly draining?	✓		
2. Are the catch basins clear of trash, sediment, and debris?	✓		
3. Has vegetation been removed from all catch basin areas?	✓		
4. Are there any signs of damage or deterioration of catch basins? If yes, which catch basin(s)? ___ (Refer to Record Drawings for catch basin numbers)		✓	
Stormwater Detention Basin and Surface Sand Filter:			
5. Does the basin have pooled or standing water? If yes, describe where: ___		✓	
6. What is the water height? ___ Approximately how many hours ago was the last rainfall? ___ How many inches of rain? ___			
7. Does the bottom appear relatively flat? No sand has washed away?	✓		
8. Are concentrated flows of runoff being unexpectedly directed into the basin? If yes, describe where: ___		✓	
9. Is there any damage to the sand bed or berms?		✓	
10. Has vegetation been removed from the basin areas?	✓		

APPENDIX G

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

	Yes	No	N/A
Inlet and Outlet Structures:			
11. Are the five inlet and four outlet structures draining properly?	✓		
12. Is there any standing water? If yes, describe where: ______		✓	
13. Are the inlets clear of trash, sediment, and debris?	✓		
14. Are the outlets (standpipe, 3" orifice, secondary outlet, and emergency spillway) clear of trash, sediment, and debris?	✓		
15. Are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where: ______		✓	
16. Has vegetation been removed from the inlets and outlets?	✓		

Additional descriptions of where repairs or maintenance is needed:

______

Inspector's Signature

APPENDIX G

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

"Tree Grove" Inspection:

	Question	Yes	No	N/A
1.	Is there any tree damage from storms? If yes, describe: ____		✓	
2.	Is there an accumulation of tree debris? If yes, describe: ____		✓	
3.	Do any trees appear infested? If yes, describe: ____		✓	
4.	Do any trees appear malnourished? If yes, describe: ____		✓	
5.	Was the last Quarterly Seasonal Maintenance performed? Date of previous maintenance: ____ (Refer to Section 2.3.2 of the Operation & Maintenance Manual)			✓
6.	Was the last Annual Arborist Inspection performed? Date of previous inspection: ____ (Refer to Section 2.3.3 of the Operation & Maintenance Manual)			✓

Additional descriptions of where repairs or maintenance is needed:

USEPA / USACE Requested that the grove area have an Overgrowth.

Note: 3 Ash Trees have dead Branches but new growth is Flourishing From the bottom.

Inspector's Signature

APPENDIX G
Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

"Pavement" Inpsection (Part of Annual Inspection):

	Yes	No	N/A
1. Is there any standing water? If yes, describe where: ______	✓		
2. Are there any signs of cracking? If so, note location and maintenance effort below.	✓		
3. Are there any signs of disintegration? If so, note location and maintenance effort below.	✓		
4. Are there any signs of distortion? If so, note location and maintenance effort below.	✓		
5. Has all vegetation been removed? If applicable, note location of vegetation below.		✓	
6. Has the usage of the Site increased to a point that warrants a Pavement Condition Index (PCI) survey?		✓	
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied? When was the date of the last CPM treatment? ______ (Refer to Section 2.2.3 of the Operation & Maintenance Manual)		✓	

Additional descriptions of where repairs or maintenance is needed:

SES IS AWAITING DIRECTION From USACE/USEPA ON SEALing crack
Small PONDING area around site: 3 at N.E. AREA, 1 AT S.W. OF WATER TOWER
1 by N.E. of Gate measure.
DISINTERGRATION: IN The S.E. AREA OF site by MANhole 13 A
DISTORTION: N.E. corner by South entrance gate
VegeTATION: grass growing by South Fire HYDRANT, also
by The WEST SIDE OF site, by water chamber.

Inspector's Signature

APPENDIX G
Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

	Yes	No	N/A
Inlet and Outlet Structures:			
11. Are the five inlet and four outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where: ______		X	
13. Are the inlets clear of trash, sediment, and debris?	X		
14. Are the outlets (standpipe, 3" orifice, secondary outlet, and emergency spillway) clear of trash, sediment, and debris?	X		
15. Are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where: ______		X	
16. Has vegetation been removed from the inlets and outlets?		X	

Additional descriptions of where repairs or maintenance is needed:

____

Inspector's Signature

APPENDIX G

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

"Pavement" Inpsection (Part of Annual Inspection):

	Yes	No	N/A
1. Is there any standing water? If yes, describe where: ______________________	☐	☒	☐
2. Are there any signs of cracking? If so, note location and maintenance effort below.	☐	☒	☐
3. Are there any signs of disintegration? If so, note location and maintenance effort below.	☐	☒	☐
4. Are there any signs of distortion? If so, note location and maintenance effort below.	☐	☒	☐
5. Has all vegetation been removed? If applicable, note location of vegetation below.	☐	☒	☐
6. Has the usage of the Site increased to a point that warrants a Pavement Condition Index (PCI) survey?	☐	☒	☐
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied? When was the date of the last CPM treatment? __________ (Refer to Section 2.2.3 of the Operation & Maintenance Manual)	☐	☒	☐

Additional descriptions of where repairs or maintenance is needed:

____

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Inspector's Signature

Appendix G
Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

"Tree Grove" Inspection:

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe: ______	☐	☒	☐
2. Is there an accumulation of tree debris? If yes, describe: ______	☐	☒	☐
3. Do any trees appear infested? If yes, describe: ______	☐	☒	☐
4. Do any trees appear malnourished? If yes, describe: ______	☐	☒	☐
5. Was the last Quarterly Seasonal Maintenance performed? Date of previous maintenance: ______ (Refer to Section 2.3.2 of the Operation & Maintenance Manual)	☐	☐	☒
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: ______ (Refer to Section 2.3.3 of the Operation & Maintenance Manual)	☐	☐	☒

Additional descriptions of where repairs or maintenance is needed:

______

Inspector's Signature

APPENDIX G
Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Basin Drainage Rate Inspection:
(completed twice a year after design rainfall event)

Date: __________

Design Rainfall Event Information
Requirements: 1.25" of rain in 2 hours

Start: __________
Stop: __________
Inches of Rainfall: __________

Inspection Data:
Start inspections 16 hours after design rain event
Perform subsequent inspections every 2 hours until the height of water drops below the top of the aggregate in the middle basin.

Inspection Run #	Target Time From Event (hrs)	Actual Time	Water height (ft)
1	16		
2	18		
3	20		
4	22		
5	24		
6	26		
7	28		
8	30		
9	32		
10	34		

Note approximate time water was drained below top of sand bed and compare to the normal drain time of 21 hours:

____

____

____
Inspector's Signature

Los Alamos Technical Associates, Inc.
756 Park Meadow Road / Westerville, Ohio 43081 / (614) 508-1200 (phone) / (614) 508-1201 (fax) / www.lata.com

July 22, 2014

Mr. Patrick Nejand
Project Manager
US Army Corps of Engineers
New York District
214 State Highway 18
East Brunswick, NJ 08816

Mr. Ken Maas
Project Manager
US Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106

SUBJECT: June 2014 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

Dear Messrs. Nejand and Maas:

Attached is the inspection report for June 2014 for the site inspection performed at the CDE site. This report details the activities completed as well as the inspection forms for the visit.

If you have any questions, please feel free call me at (614) 508-1200.

Sincerely,
LOS ALAMOS TECHNICAL ASSOCIATES, INC.

Shannon Lloyd
Sr. Project Manager

Attachments

cc: File

TO: Patrick Nejand, Project Manager
Ken Mass, Project Manager
United States Army Corps of Engineers (USACE)

FROM: Shannon Lloyd, Project Manager
Los Alamos Technical Associates, Inc. (LATA)

SUBJECT: June 2014 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

LATA Project # 11266
Contract # W912DQ-09-D-3003,
Task Order # 0011

DATE: July 22, 2014

CURRENT ACTIVITIES

LATA's technician visited the Cornell Dubilier Electronics (CDE) Superfund Site for the regularly scheduled inspection visit on June 25 and 26, 2014 to perform the routine inspection of the facilities.

LATA met with USEPA and USACE on June 25, 2014 to review the site features and work expectations. LATA returned on June 26, 2014 to perform the routine inspection and housekeeping activities. Work performed during the visit included; pulled woody vegetation from around and within the drainage basins, picked up trash from the fence line, inspected the catch basin and drainage basin system, inspected the perimeter fence, gates, etc., and performed a walking inspection of the asphalt cap areas. Copies of the inspection forms are attached to this report.

A total of two bags of trash (paper, plastic bottles, etc.) were picked up from around the fence line in various areas. The trash was disposed of in the local technicians office dumpster.

MANPOWER REPORTING

Date	LATA Labor	Other Labor
June 25, 2014	2 hrs.	4 hrs. (USEPA and USACE)
June 26, 2014	8 hrs.	

OUTSTANDING ISSUES/RESOLUTIONS

LATA submitted the DRAFT Accident Prevention Plan for review by USACE on July 3, 2014.

There are small surficial cracks were noted in the asphalt cap. These surface cracks appear to be limited to the pavement seams. LATA will discuss sealing these with an asphalt contractor and schedule as needed repairs. There are a few other cracks noted in the cap area throughout. LATA will discuss these with the contractor as well. All of the areas will be monitored for further damage until the assessment or repair is made.

PLANS FOR NEXT MONTH

Plans for the July 2014 visit includes inspection and general housekeeping activities at the site.

LATA plans to install a level transducer in the drainage basin upon receipt of materials. The transducer will be used to monitor the drainage time for the basin following a rain event. The data will be reported to USACE as it is collected.

Site Inspection Forms

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection being Conducted X **Monthly**

Quarterly ______ **Annually** ______ **After 1" or Greater Rainfall** ______

After 1.25" in 2 hour storm event ______ **Under Special Circumstances** ______

Inspection Date: 6/26/14 **Weather** Clear 70's

Inspectors Name Shannon Lloyd Sonil Samaroo

Basin Inspection:

	Yes	No	N/A
Catch Basins (23 Structures)			
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins?		X	

If yes, which catch basin(s)? ______
(Refer to Record Drawings for catch basin numbers)

Stormwater Detention Basin and Surface Sand Filter:

	Yes	No	N/A
5. Does the basin have pooled or standing water?	X		

If yes, describe where rain from night before
6. What is the water height ~6"
Approximately how many hours was the last rainfall? <1.0
How many inches of rain? <1"

	Yes	No	N/A
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin?		X	

If yes, describe where ______

	Yes	No	N/A
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?	X		

removed woody vegetation by pulling or cutting @ groundlevel.

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inlet and Outlet Structures:

11. Are the five inlet and outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where ______		X	
13. Are the inlets clear of trash, sediment and debris?	X		
14. Are the outlets (standpipes, 3" Orifice, secondary outlet and emergency spillway) clear of trash, sediment, and debris?	X		
15. are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where ______		X	
16. Has vegetation been removed from inlet and outlets?			X

Additional descriptions of where repairs or maintenance is needed:

______

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 6/26/14 **Weather** Clear 70's

Inspectors Name Shannon Lloyd Sunil Samaroo

"Tree Grove" Inspection

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe:		X	
2. Is there an accumulation of tree debris? If yes, describe:		X	
3. Do any trees appear infested? If yes, describe:			X
4. Do any trees appear malnourished? If yes, describe:			X
5. Was the last Quarterly Seasonal Maintenance Performed? Date of previous maintenance: (Refer to section 2.3.2 of the Operation & Maintenance Manual)			X
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: (Refer to section 2.3.3 of the Operation & Maintenance Manual)			X

Additonal descriptions of where repairs or maintenance is needed:

tree buffer being maintained "as is" by direction of USACE & EPA.

Pulled Bamboo "Runners" that had extended onto asphalt

Inspector's Signature

SL

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 6/26/14 **Weather** Clear 70's

Inspectors Name Shannon Lloyd

Debris, Trash, Vegetation and Sediment Removal and Inspections

Comments removed trash from perimeter fences & accumulation in corner area behind the water tower. approximately 2 bags. disposed of trash at URS dumpster.

Overall site is in excellent condition

General Houskeeping

Comments

Spot sprayed spotty weeds in asphalt area w/ round up. Asphalt cap has minor cracking predominantly @ seams. will talk w/ contractor for recommendation on sealing.

Fencing and Gates

Comments Good

Trash and Debris

Comments

See above

Snow Removal

Comments

N/A

SL

Los Alamos Technical Associates, Inc.

756 Park Meadow Road / Westerville, Ohio 43081 / (614) 508-1200 (phone) / (614) 508-1201 (fax) / www.lata.com

August 15, 2014

Mr. Patrick Nejand
Project Manager
US Army Corps of Engineers
New York District
214 State Highway 18
East Brunswick, NJ 08816

Mr. Ken Maas
Project Manager
US Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106

SUBJECT: July 2014 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

Dear Messrs. Nejand and Maas:

Attached is the inspection report for July 2014 for the site inspection performed at the CDE site. This report details the activities completed as well as the inspection forms for the visit.

If you have any questions, please feel free call me at (614) 508-1200.

Sincerely,
LOS ALAMOS TECHNICAL ASSOCIATES, INC.

Shannon Lloyd
Sr. Project Manager

Attachments

cc: File

TO: Patrick Nejand, Project Manager
Ken Mass, Project Manager
United States Army Corps of Engineers (USACE)

FROM: Shannon Lloyd, Project Manager
Los Alamos Technical Associates, Inc. (LATA)

SUBJECT: July 2014 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

LATA Project # 11266
Contract # W912DQ-09-D-3003,
Task Order # 0011

DATE: August 15, 2014

CURRENT ACTIVITIES

LATA's technician visited the Cornell Dubilier Electronics (CDE) Superfund Site for the regularly scheduled inspection visit on July 25, 2014 to perform the routine inspection of the facilities.

LATA met with USEPA and USACE on July 25, 2014 to perform the monthly inspection and housekeeping activities. Work performed during the visit included; pulled woody vegetation from around and within the drainage basins, picked up trash from the fence line, inspected the catch basin and drainage basin system, inspected the perimeter fence, gates, etc., and performed a walking inspection of the asphalt cap areas. Copies of the inspection forms are attached to this report.

One bag of trash (paper, plastic bottles, etc.) was picked up from around the fence line in various areas. The trash was disposed of in the local technicians office dumpster.

MANPOWER REPORTING

Date	LATA Labor
July 25, 2014	6 hrs.

OUTSTANDING ISSUES/RESOLUTIONS

LATA submitted the DRAFT Accident Prevention Plan for review by USACE on July 3, 2014.

Surficial cracks were noted in the asphalt cap. These surface cracks appear to be limited to the pavement seams. LATA will discuss sealing these with an asphalt contractor and schedule as needed repairs. The areas will be monitored for further damage until the assessment or repair is made.

PLANS FOR NEXT MONTH

Plans for the August 2014 visit includes inspection and general housekeeping activities at the site.

Site Inspection Forms

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection being Conducted X **Monthly**

Quarterly ______ **Annually** ______ **After 1" or Greater Rainfall** ______

Inspection Date: 7/25/2014 **Weather** Sunny, 80s

Inspectors Name Sunil Samaroo, Stephen Libert

Basin Inspection:

Catch Basins (23 Structures)

	Yes	No	N/A
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins?		X	

If yes, which catch basin(s)? ______
(Refer to Record Drawings for catch basin numbers)

Stormwater Detention Basin and Surface Sand Filter:

	Yes	No	N/A
5. Does the basin have pooled or standing water?	X		

If yes, describe where **Rain from the previous day**
6. What is the water height **< 1"**
Approximately how many hours was the last rainfall? **< 1.0**
How many inches of rain? **< 1"**

	Yes	No	N/A
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin?		X	

If yes, describe where ______

	Yes	No	N/A
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?	X		

Woody vegetation was removed by pulling/cutting at ground level.

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inlet and Outlet Structures:

11. Are the five inlet and outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where ______		X	
13. Are the inlets clear of trash, sediment and debris?	X		
14. Are the outlets (standpipes, 3" Orifice, secondary outlet and emergency spillway) clear of trash, sediment, and debris?	X		
15. are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where ______		X	
16. Has vegetation been removed from inlet and outlets?			X

Additional descriptions of where repairs or maintenance is needed:

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 7/25/2014 **Weather** Sunny, 80s

Inspectors Name Sunil Samaroo, Stephen Libert

"Tree Grove" Inspection

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe:		X	
2. Is there an accumulation of tree debris? If yes, describe:		X	
3. Do any trees appear infested? If yes, describe:			X
4. Do any trees appear malnourished? If yes, describe:			X
5. Was the last Quarterly Seasonal Maintenance Performed? Date of previous maintenance: (Refer to section 2.3.2 of the Operation & Maintenance Manual)			X
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: (Refer to section 2.3.3 of the Operation & Maintenance Manual)			X

Additonal descriptions of where repairs or maintenance is needed:

Tree buffer being maintained "as is" by direction of USACE and EPA.

Pulled bamboo "runners" that extended onto the asphalt.

Inspector's Signature

Sunil Samaroo

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 7/25/2014 **Weather** Sunny, 80s

Inspectors Name Sunil Samaroo, Stephen Libert

Debris, Trash, Vegetation and Sediment Removal and Inspections
Comments

Removed trash from perimeter fence and accumulation in corner area (behind the water tower). One bag of trash, half filled, disposed of at URS dumpster.
Over al, the site remains in good condition.

General Houskeeping
Comments

Spot sprayed weeds in asphalt area with Round Up.
Asphalt has minor cracking predominantly at seems, previously observed.

Fencing and Gates
Comments

GOOD

Trash and Debris
Comments

(See above)

Snow Removal
Comments

N/A

Sunil Samaroo

7-25-2014 Cornell-Dubilier Electronics

Site Inspection photos

Catch basin (before)

Catch basin (after) debris removed

Detention basin, < 1” of water

Detention basin, < 1” of water

Cold patch swept back into MW area

Cold patch swept back into MW area

Cold patch swept back into MW area

Drums still on-site

Weeds sprayed with Round Up

Bamboo runners left to dry on asphalt

Additional site photos

Additional site photos

Additional site photos

Additional site photos

Additional site photos

Los Alamos Technical Associates, Inc.

756 Park Meadow Road / Westerville, Ohio 43081 / (614) 508-1200 (phone) / (614) 508-1201 (fax) / www.lata.com

September 12, 2014

Mr. Patrick Nejand
Project Manager
US Army Corps of Engineers
New York District
214 State Highway 18
East Brunswick, NJ 08816

Mr. Ken Maas
Project Manager
US Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106

SUBJECT: August 2014 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

Dear Messrs. Nejand and Maas:

Attached is the inspection report for August 2014 for the site inspection performed at the CDE site. This report details the activities completed as well as the inspection forms for the visit.

If you have any questions, please feel free call me at (614) 508-1200.

Sincerely,
LOS ALAMOS TECHNICAL ASSOCIATES, INC.

Shannon Lloyd
Sr. Project Manager

Attachments

cc: File

TO: Patrick Nejand, Project Manager
Ken Mass, Project Manager
United States Army Corps of Engineers (USACE)

FROM: Shannon Lloyd, Project Manager
Los Alamos Technical Associates, Inc. (LATA)

SUBJECT: August 2014 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

LATA Project # 11266
Contract # W912DQ-09-D-3003,
Task Order # 0011

DATE: September 12, 2014

CURRENT ACTIVITIES

LATA's technician visited the Cornell Dubilier Electronics (CDE) Superfund Site for the regularly scheduled inspection visit on August 21, 2014 to perform the routine inspection of the facilities.

LATA met with USEPA August 21, 2014 to perform the monthly inspection and housekeeping activities. Work performed during the visit included; pulled woody vegetation from around and within the drainage basins, picked up trash from the fence line, inspected the catch basin and drainage basin system, inspected the perimeter fence, gates, etc., and performed a walking inspection of the asphalt cap areas. Copies of the inspection forms and site photos are attached to this report.

A total of one bag of trash (paper, plastic bottles, etc.) was picked up from around the fence line in various areas. The trash was disposed of in the local technicians office dumpster.

MANPOWER REPORTING

Date	LATA Labor	Other Labor
July 25, 2014	4 hrs.	.75 (USACE)

OUTSTANDING ISSUES/RESOLUTIONS

LATA submitted the DRAFT Accident Prevention Plan for review by USACE on July 3, 2014.

Surficial cracks were noted in the asphalt cap. These surface cracks appear to be limited to the pavement seams. LATA will discuss sealing these with an asphalt contractor and schedule as needed repairs. The areas will be monitored for further damage until the assessment or repair is made.

PLANS FOR NEXT MONTH

Plans for the September 2014 visit includes inspection and general housekeeping activities and downloading the drainage basin level datalogger.

Site Inspection Forms

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection being Conducted X **Monthly**

Quarterly ______ **Annually** ______ **After 1" or Greater Rainfall** ______

Inspection Date: 8/21/2014 **Weather** Sunny, 70s

Inspectors Name Sunil Samaroo

Basin Inspection:

	Yes	No	N/A
Catch Basins (23 Structures)			
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins?		X	

If yes, which catch basin(s)? ______
(Refer to Record Drawings for catch basin numbers)

Stormwater Detention Basin and Surface Sand Filter:

	Yes	No	N/A
5. Does the basin have pooled or standing water?		X	

If yes, describe where ______
6. What is the water height ______
Approximately how many hours was the last rainfall? ______
How many inches of rain? ______

	Yes	No	N/A
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin?		X	

If yes, describe where ______

	Yes	No	N/A
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?	X		

Woody vegetation was removed by pulling/cutting at ground level.

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inlet and Outlet Structures:

11. Are the five inlet and outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where ______		X	
13. Are the inlets clear of trash, sediment and debris?	X		
14. Are the outlets (standpipes, 3" Orifice, secondary outlet and emergency spillway) clear of trash, sediment, and debris?	X		
15. are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where ______		X	
16. Has vegetation been removed from inlet and outlets?			X

Additional descriptions of where repairs or maintenance is needed:

Inspector's Signature Anil Amarasi

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: **8/21/2014** **Weather** **Sunny, 70s**

Inspectors Name **Sunil Samaroo**

"Tree Grove" Inspection

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe:		X	
2. Is there an accumulation of tree debris? If yes, describe: Broken/ fallen branch in water tower area	X		
3. Do any trees appear infested? If yes, describe:			X
4. Do any trees appear malnourished? If yes, describe:			X
5. Was the last Quarterly Seasonal Maintenance Performed? Date of previous maintenance: (Refer to section 2.3.2 of the Operation & Maintenance Manual)			X
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: (Refer to section 2.3.3 of the Operation & Maintenance Manual)			X

Additonal descriptions of where repairs or maintenance is needed:

Tree buffer being maintained "as is" by direction of USACE and EPA.

Pulled bamboo "runners" that extended onto the asphalt.

Broken/ fallen branch in water tower area removed from site.

Inspector's Signature Sunil Samaroo

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 8/21/2014 **Weather** Sunny, 70s

Inspectors Name Sunil Samaroo

Debris, Trash, Vegetation and Sediment Removal and Inspections
Comments

Removed trash from perimeter fence.
One bag of trash, half filled, disposed of at URS dumpster.
Over al, the site remains in good condition.

General Houskeeping
Comments

Spot sprayed weeds in asphalt area with Round Up.
Asphalt has minor cracking predominantly at seems, previously observed.
Drums removed from site.
ACE personelle Patrick Nejand on-site from 1115 to 1200.

Fencing and Gates
Comments

GOOD

Trash and Debris
Comments

(See above)

Snow Removal
Comments

N/A

8-21-2014 Cornell-Dubilier Electronics

Site Inspection photos

Fence drive by inspection photos

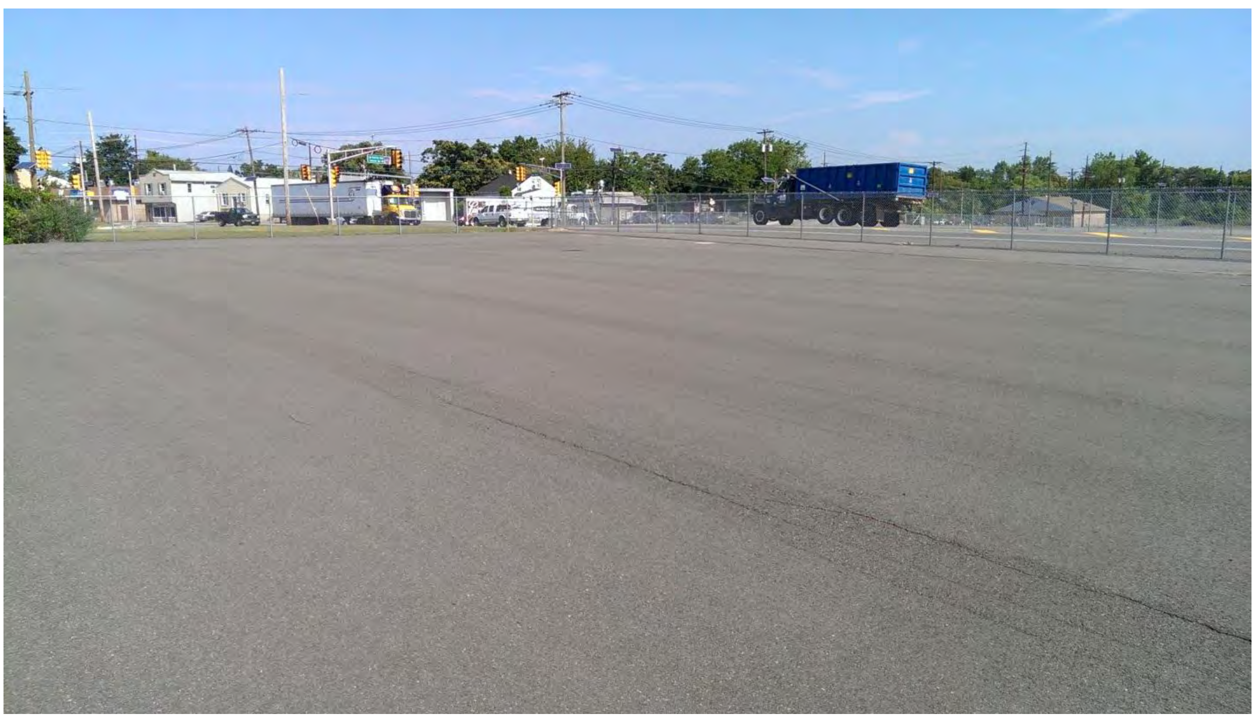
Fallen branch (before / after)

Detention basin, < 1” of water

Cold patch swept back into MW area (before / after)

Weeds sprayed with Round Up

Additional site photos (below)



Los Alamos Technical Associates, Inc.

756 Park Meadow Road / Westerville, Ohio 43081 / (614) 508-1200 (phone) / (614) 508-1201 (fax) / www.lata.com

September 29, 2014

Mr. Patrick Nejand
Project Manager
US Army Corps of Engineers
New York District
214 State Highway 18
East Brunswick, NJ 08816

Mr. Ken Maas
Project Manager
US Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106

SUBJECT: September 2014 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

Dear Messrs. Nejand and Maas:

Attached is the inspection report for September 2014 for the site inspection performed at the CDE site. This report details the activities completed as well as the inspection forms for the visit.

If you have any questions, please feel free call me at (614) 508-1200.

Sincerely,
LOS ALAMOS TECHNICAL ASSOCIATES, INC.

Shannon Lloyd
Sr. Project Manager

Attachments

cc: File

TO: Patrick Nejand, Project Manager
Ken Mass, Project Manager
United States Army Corps of Engineers (USACE)

FROM: Shannon Lloyd, Project Manager
Los Alamos Technical Associates, Inc. (LATA)

SUBJECT: September 2014 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

LATA Project # 11266
Contract # W912DQ-09-D-3003,
Task Order # 0011

DATE: September 29, 2014

CURRENT ACTIVITIES

LATA's technician visited the Cornell Dubilier Electronics (CDE) Superfund Site for the regularly scheduled inspection visit on September 18th and 19th, 2014 to perform the routine inspection of the facilities and install a level datalogger in the drainage basin.

Work performed during the visit included; pulled woody vegetation from around and within the drainage basins, picked up trash from the fence line, inspected the catch basin and drainage basin system, inspected the perimeter fence, gates, etc., and performed a walking inspection of the asphalt cap areas. Copies of the inspection forms are attached to this report.

Additionally, a level transducer was installed in the drainage basin to monitor the water level and drain time of the basin following rain events. A Solinst Levelogger was installed inside of a perforated 2" PVC protective pipe. The pipe extends to the top of the drainage basin for access and ease of downloading. A Barologger is attached to the fence adjacent the pipe for the Levelogger. The Barologger collects barometric pressure data and is used in the level calculation to compensate for changing weather conditions. Photos of the installation are attached to this report.

A total of one bag of trash (paper, plastic bottles, etc.) was picked up from around the fence line in various areas. The trash was disposed of in the local technicians office dumpster.

MANPOWER REPORTING

Date	LATA Labor
September 18-19, 2014	10 hrs.

OUTSTANDING ISSUES/RESOLUTIONS

LATA submitted the DRAFT Accident Prevention Plan for review by USACE on July 3, 2014.

Surficial cracks were noted in the asphalt cap. These surface cracks appear to be limited to the pavement seams. LATA will discuss sealing these with an asphalt contractor and schedule as needed repairs. The areas will be monitored for further damage until the assessment or repair is made.

PLANS FOR NEXT MONTH

Plans for the October 2014 visit includes inspection and general housekeeping activities and downloading the drainage basin level datalogger.

Site Inspection Forms

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection being Conducted X **Monthly**

Quarterly ____ **Annually** ____ **After 1" or Greater Rainfall** ____

Inspection Date: **9/18/14 and 9/19/14** **Weather** **Sunny, 70s**

Inspectors Name **Sunil Samaroo**

Basin Inspection:

	Yes	No	N/A
Catch Basins (23 Structures)			
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins?		X	

If yes, which catch basin(s)? ____
(Refer to Record Drawings for catch basin numbers)

Stormwater Detention Basin and Surface Sand Filter:

	Yes	No	N/A
5. Does the basin have pooled or standing water?		X	

If yes, describe where ____
6. What is the water height ____
Approximately how many hours was the last rainfall? ____
How many inches of rain? ____

	Yes	No	N/A
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin?		X	

If yes, describe where ____

	Yes	No	N/A
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?	X		

Woody vegetation was removed by pulling/cutting at ground level.

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inlet and Outlet Structures:

11. Are the five inlet and outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where ______		X	
13. Are the inlets clear of trash, sediment and debris?	X		
14. Are the outlets (standpipes, 3" Orifice, secondary outlet and emergency spillway) clear of trash, sediment, and debris?	X		
15. are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where ______		X	
16. Has vegetation been removed from inlet and outlets?			X

Additional descriptions of where repairs or maintenance is needed:

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: **9/18/14 and 9/19/14** **Weather** **Sunny, 70s**

Inspectors Name **Sunil Samaroo**

"Tree Grove" Inspection

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe:		X	
2. Is there an accumulation of tree debris? If yes, describe:		X	
3. Do any trees appear infested? If yes, describe:			X
4. Do any trees appear malnourished? If yes, describe:			X
5. Was the last Quarterly Seasonal Maintenance Performed? Date of previous maintenance: (Refer to section 2.3.2 of the Operation & Maintenance Manual)			X
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: (Refer to section 2.3.3 of the Operation & Maintenance Manual)			X

Additonal descriptions of where repairs or maintenance is needed:

Tree buffer being maintained "as is" by direction of USACE and EPA.

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 9/18/14 and 9/19/14 **Weather** Sunny, 70s

Inspectors Name Sunil Samaroo

Debris, Trash, Vegetation and Sediment Removal and Inspections
Comments

Removed trash from perimeter fence.
One bag of trash, quarter filled, disposed of at URS dumpster.
Over al, the site remains in good condition.

General Houskeeping
Comments

Spot sprayed weeds in asphalt area with Round Up.
Asphalt has minor cracking predominantly at seems, previously observed.
2" PVC protective piping installed in center section of the drainage basin containing
data logger to collect water levels after rain events and barologger hung on fence adjacent to data logger.

Fencing and Gates
Comments

GOOD

Trash and Debris
Comments

(See above)

Snow Removal
Comments

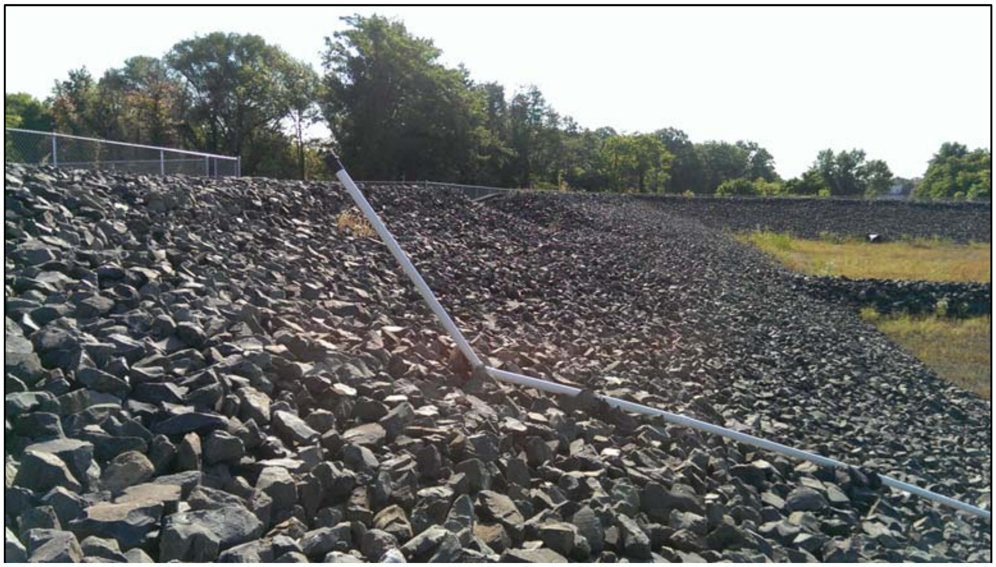
N/A

Cornell Site Photos:

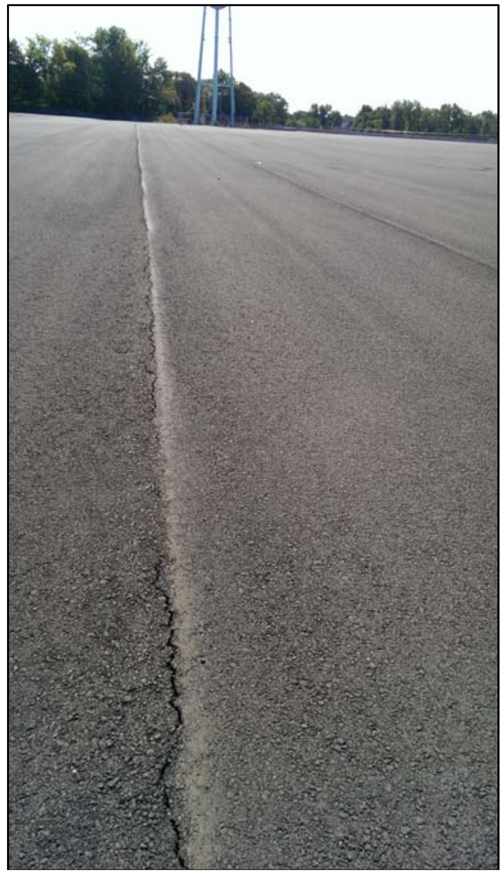
9/18/14 and 9/19/14

Perimeter fence

Installed data logger/ level logger and barologger



Surface cracks in asphalt cap near the water tower area.



Los Alamos Technical Associates, Inc.
756 Park Meadow Road / Westerville, Ohio 43081 / (614) 508-1200 (phone) / (614) 508-1201 (fax) / www.lata.com

October 21, 2014

Mr. Patrick Nejand
Project Manager
US Army Corps of Engineers
New York District
214 State Highway 18
East Brunswick, NJ 08816

Mr. Ken Maas
Project Manager
US Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106

SUBJECT: October 2014 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

Dear Messrs. Nejand and Maas:

Attached is the inspection report for October 2014 for the site inspection performed at the CDE site. This report details the activities completed as well as the inspection forms for the visit.

If you have any questions, please feel free call me at (614) 508-1200.

Sincerely,
LOS ALAMOS TECHNICAL ASSOCIATES, INC.

Shannon Lloyd
Sr. Project Manager

Attachments

cc: File

TO: Patrick Nejand, Project Manager
Ken Mass, Project Manager
United States Army Corps of Engineers (USACE)

FROM: Shannon Lloyd, Project Manager
Los Alamos Technical Associates, Inc. (LATA)

SUBJECT: October 2014 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

LATA Project # 11266
Contract # W912DQ-09-D-3003,
Task Order # 0011

DATE: October 21, 2014

CURRENT ACTIVITIES

LATA's technician visited the Cornell Dubilier Electronics (CDE) Superfund Site for the regularly scheduled inspection visit on October 16, 2014 to perform the routine inspection of the facilities.

Work performed during the visit included; picked up trash from the fence line, inspected the catch basin and drainage basin system, inspected the perimeter fence, gates, etc., pulled woody vegetation from accessible areas of the drainage basin, download the data from the basin dataloggers and performed a walking inspection of the asphalt cap areas. Copies of the inspection forms are attached to this report.

LATA escorted a representative from Pave Rite, Inc. to inspect the surficial cracks in the asphalt cap for sealing. The inspection area was limited to the eastern side of the cap area from the entrance gate off Hamilton Ave. south to the water tower and east to the perimeter fence. The contractor noted approximately 4,200 lineal feet of cracking that could be sealed. Upon authorization by USACE, LATA will schedule the repairs.

One bag of trash (paper, plastic bottles, etc.) was picked up from around the fence line in various areas. The trash was disposed of in the local technicians office dumpster.

MANPOWER REPORTING

Date	LATA Labor
October 16, 2014	3 hrs.

OUTSTANDING ISSUES/RESOLUTIONS

LATA submitted the DRAFT Accident Prevention Plan for review by USACE on July 3, 2014.

PLANS FOR NEXT MONTH

Plans for the November 2014 visit includes inspection and general housekeeping activities and downloading the drainage basin level datalogger.

Site Inspection Forms

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection being Conducted X **Monthly**

Quarterly ______ **Annually** ______ **After 1" or Greater Rainfall** ______

Inspection Date: **10/16/2014** **Weather** **Sunny, 60s**

Inspectors Name **Sunil Samaroo**

Basin Inspection:

Catch Basins (23 Structures)

	Yes	No	N/A
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins?		X	

If yes, which catch basin(s)? ______
(Refer to Record Drawings for catch basin numbers)

Stormwater Detention Basin and Surface Sand Filter:

	Yes	No	N/A
5. Does the basin have pooled or standing water?	X		

If yes, describe where **Water was observed in basin, due to rainfall within a few hrs of being on-site**
6. What is the water height (~ 6 inches)
Approximately how many hours was the last rainfall? **3 to 4 hours**
How many inches of rain? **>1**

	Yes	No	N/A
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin?		X	

If yes, describe where ______

	Yes	No	N/A
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?	X		

Woody vegetation was removed by pulling/cutting at ground level.

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inlet and Outlet Structures:

11. Are the five inlet and outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where ______		X	
13. Are the inlets clear of trash, sediment and debris?	X		
14. Are the outlets (standpipes, 3" Orifice, secondary outlet and emergency spillway) clear of trash, sediment, and debris?	X		
15. are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where ______		X	
16. Has vegetation been removed from inlet and outlets?			X

Additional descriptions of where repairs or maintenance is needed:

Sunil Sumarco

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: **10/16/2014** **Weather** **Sunny, 60s**

Inspectors Name **Sunil Samaroo**

"Tree Grove" Inspection

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe:		X	
2. Is there an accumulation of tree debris? If yes, describe:		X	
3. Do any trees appear infested? If yes, describe:			X
4. Do any trees appear malnourished? If yes, describe:			X
5. Was the last Quarterly Seasonal Maintenance Performed? Date of previous maintenance: (Refer to section 2.3.2 of the Operation & Maintenance Manual)			X
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: (Refer to section 2.3.3 of the Operation & Maintenance Manual)			X

Additional descriptions of where repairs or maintenance is needed:

Tree buffer being maintained "as is" by direction of USACE and EPA.

Pulled bamboo "runners" that extended onto the asphalt.

Sunil Samaroo

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 10/16/2014 **Weather** Sunny, 60s

Inspectors Name Sunil Samaroo

Debris, Trash, Vegetation and Sediment Removal and Inspections
Comments

Removed trash from perimeter fence.
One bag of trash, quarter filled, disposed of at URS dumpster.
Over al, the site remains in good condition.

General Housekeeping
Comments

Spot sprayed weeds in asphalt area with Round Up.
Asphalt has minor cracking predominantly at seems, previously observed.
Pave-Rite, Inc. (Robert J. Hering) 732-271-0110 on-site to take measurements/ provide estimate of cracked asphalt around water tower area.

Fencing and Gates
Comments

GOOD

Trash and Debris
Comments

(See above)

Snow Removal
Comments

N/A

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Pavement Inspection (Part of Annual Inspection)

	Yes	No	N/A
1. Is there any standing water? If yes, describe where ______			X
2. Are there any signs of cracking? If so, note location and maintenance effort below.	X		
3. Are there any signs of disintegration? If so, note location and maintenance effort below.			X
4. Are there any sins of distortion? If so, note location and maintenance effort below.			X
5. Has all vegetation been removed? If applicable, note location of vegetation below	X		
6. Has usage of the site increase to a point that warrants a Pavement Condition Index (PCI) Survey?			X
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied?			X

When was date of the last CPM treatment? ______
(Refer to Section 2.2.3 of the Operations & Maintenance Manual)

Additional descriptions of where repairs or maintenance is needed:

Cracks in asphalt developing in the area of the water tower.

Inspector's Signature Sunil Sunnaroo

10-16-2014 Cornell-Dubilier Electronics

Site Inspection photos

Fence drive by inspection photos

Detention basin, ~6 inches of water

Cold patch swept back into MW area

Additional site photos

Los Alamos Technical Associates, Inc.

756 Park Meadow Road / Westerville, Ohio 43081 / (614) 508-1200 (phone) / (614) 508-1201 (fax) / www.lata.com

November 19, 2014

Mr. Patrick Nejand
Project Manager
US Army Corps of Engineers
New York District
214 State Highway 18
East Brunswick, NJ 08816

Mr. Ken Maas
Project Manager
US Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106

SUBJECT: November 2014 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

Dear Messrs. Nejand and Maas:

Attached is the inspection report for November 2014 for the site inspection performed at the CDE site. This report details the activities completed as well as the inspection forms for the visit.

If you have any questions, please feel free call me at (614) 508-1200.

Sincerely,
LOS ALAMOS TECHNICAL ASSOCIATES, INC.

Shannon Lloyd
Sr. Project Manager

Attachments

cc: File

TO: Patrick Nejand, Project Manager
Ken Mass, Project Manager
United States Army Corps of Engineers (USACE)

FROM: Shannon Lloyd, Project Manager
Los Alamos Technical Associates, Inc. (LATA)

SUBJECT: November 2014 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

LATA Project # 11266
Contract # W912DQ-09-D-3003,
Task Order # 0011

DATE: November 19, 2014

CURRENT ACTIVITIES

LATA's technician visited the Cornell Dubilier Electronics (CDE) Superfund Site for the regularly scheduled inspection visit on November 13, 2014 to perform the routine inspection of the facilities.

Work performed during the visit included; picked up trash from the fence line, inspected the catch basin and drainage basin system, inspected the perimeter fence, gates, etc., pulled woody vegetation from accessible areas of the drainage basin, download the data from the basin dataloggers and performed a walking inspection of the asphalt cap areas. Copies of the inspection forms are attached to this report.

Approximately one bag of trash (paper, plastic bottles, etc.) was picked up from around the fence line in various areas. The trash was disposed of in the local technicians office dumpster.

MANPOWER REPORTING

Date	LATA Labor
November 13, 2014	3 hrs.

OUTSTANDING ISSUES/RESOLUTIONS

LATA submitted the DRAFT Accident Prevention Plan for review by USACE on July 3, 2014.

PLANS FOR NEXT MONTH

Plans for the December 2014 visit includes inspection and general housekeeping activities and downloading the drainage basin level datalogger. A snow removal has been placed under contract to remove snow from the sidewalk paralleling the Hamilton Boulevard when snowfall totals are greater than two inches. This removal will be made on an as needed basis.

Site Inspection Forms
and
Photo Log

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection being Conducted X **Monthly**

Quarterly ______ **Annually** ______ **After 1" or Greater Rainfall** ______

Inspection Date: **11/13/2014** **Weather** **Overcast, 40s**

Inspectors Name **Sunil Samaroo**

Basin Inspection:

Catch Basins (23 Structures)

	Yes	No	N/A
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins?		X	

If yes, which catch basin(s)? ______
(Refer to Record Drawings for catch basin numbers)

Stormwater Detention Basin and Surface Sand Filter:

	Yes	No	N/A
5. Does the basin have pooled or standing water?		X	

If yes, describe where ______
6. What is the water height (~ 6 inches) ______
Approximately how many hours was the last rainfall? ______
How many inches of rain? ______

	Yes	No	N/A
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin?		X	

If yes, describe where ______

	Yes	No	N/A
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?	X		

Woody vegetation was removed by pulling/cutting at ground level.

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inlet and Outlet Structures:

11. Are the five inlet and outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where ______		X	
13. Are the inlets clear of trash, sediment and debris?	X		
14. Are the outlets (standpipes, 3" Orifice, secondary outlet and emergency spillway) clear of trash, sediment, and debris?	X		
15. are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where ______		X	
16. Has vegetation been removed from inlet and outlets?			X

Additional descriptions of where repairs or maintenance is needed:

Inspector's Signature [signature]

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: **11/13/2014** **Weather** **Overcast, 40s**

Inspectors Name **Sunil Samaroo**

"Tree Grove" Inspection

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe:		X	
2. Is there an accumulation of tree debris? If yes, describe:		X	
3. Do any trees appear infested? If yes, describe:			X
4. Do any trees appear malnourished? If yes, describe:			X
5. Was the last Quarterly Seasonal Maintenance Performed? Date of previous maintenance: (Refer to section 2.3.2 of the Operation & Maintenance Manual)			X
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: (Refer to section 2.3.3 of the Operation & Maintenance Manual)			X

Additional descriptions of where repairs or maintenance is needed:

Tree buffer being maintained "as is" by direction of USACE and EPA.

Inspector's Signature Sunil Samaroo

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 11/13/2014 **Weather** Overcast, 40s

Inspectors Name Sunil Samaroo

Debris, Trash, Vegetation and Sediment Removal and Inspections
Comments

Removed trash from perimeter fence.
One bag of trash, 2/3 filled, disposed of at URS dumpster.
Over all, the site remains in good condition.

General Housekeeping
Comments

Spot sprayed weeds in asphalt area with Round Up.
Asphalt has minor cracking predominantly at seems, previously observed.

Fencing and Gates
Comments

GOOD

Trash and Debris
Comments

(See above)

Snow Removal
Comments

N/A

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Pavement Inspection (Part of Annual Inspection)

	Yes	No	N/A
1. Is there any standing water? If yes, describe where ______			X
2. Are there any signs of cracking? If so, note location and maintenance effort below.	X		
3. Are there any signs of disintegration? If so, note location and maintenance effort below.			X
4. Are there any sins of distortion? If so, note location and maintenance effort below.			X
5. Has all vegetation been removed? If applicable, note location of vegetation below	X		
6. Has usage of the site increase to a point that warrants a Pavement Condition Index (PCI) Survey?			X
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied?			X

When was date of the last CPM treatment? ______
(Refer to Section 2.2.3 of the Operations & Maintenance Manual)

Additional descriptions of where repairs or maintenance is needed:

Cracks in asphalt developing in the area of the water tower, previously observed.

Inspector's Signature Sunil Sumaroo

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Basin Drainage Rate Inspection:
(completed twice a year after a design rainfall event)

Date: ____________________

Design Rainfall Event Information
Requirements: 1.25" of rain in 2 hrs

Start: ____________________
Stop: ____________________
Inches of Rainfall: ____________________

Inspection Data
Start inspections 16 hours after design rain event
Perform subsequent inspection every 2 hours until height of water drops below the to of the aggregate in the middle basin

Inspection Run #	Target time from Event (hrs)	Actual Time	Water Height (ft)
1	16		
2	18		
3	20		
4	22		
5	24		
6	26		
7	28		
8	30		
9	32		
10	34		

Note approximate time water was drained below top of sand bed and compared to the normal drain time of 21 hrs.

____

____

____
Inspector's Signature

11-13-2014 Cornell-Dubilier Electronics

Site Inspection photos

Fence drive by inspection photos


FULTON ST
SPICER AVE


TRUCK ROUTE

Additional site photos

Los Alamos Technical Associates, Inc.
756 Park Meadow Road / Westerville, Ohio 43081 / (614) 508-1200 (phone) / (614) 508-1201 (fax) / www.lata.com

January 15, 2015

Mr. Patrick Nejand
Project Manager
US Army Corps of Engineers
New York District
214 State Highway 18
East Brunswick, NJ 08816

Mr. Ken Maas
Project Manager
US Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106

SUBJECT: December 2014 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

Dear Messrs. Nejand and Maas:

Attached is the inspection report for December 2014 for the site inspection performed at the CDE site. This report details the activities completed as well as the inspection forms for the visit.

If you have any questions, please feel free call me at (614) 508-1200.

Sincerely,
LOS ALAMOS TECHNICAL ASSOCIATES, INC.

Shannon Lloyd
Sr. Project Manager

Attachments

cc: File

TO: Patrick Nejand, Project Manager
Ken Mass, Project Manager
United States Army Corps of Engineers (USACE)

FROM: Shannon Lloyd, Project Manager
Los Alamos Technical Associates, Inc. (LATA)

SUBJECT: December 2014 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

LATA Project # 11266
Contract # W912DQ-09-D-3003,
Task Order # 0011

DATE: January 15, 2015

CURRENT ACTIVITIES

LATA's technician visited the Cornell Dubilier Electronics (CDE) Superfund Site for the regularly scheduled inspection visit on December 19, 2014 to perform the routine inspection of the facilities.

Work performed during the visit included; picked up trash from the fence line, inspected the catch basin and drainage basin system, inspected the perimeter fence, gates, etc., pulled woody vegetation from accessible areas of the drainage basin, download the data from the basin dataloggers and performed a walking inspection of the asphalt cap areas. Copies of the inspection forms are attached to this report.

Approximately one bag of trash (paper, plastic bottles, etc.) was picked up from around the fence line in various areas. The trash was disposed of in the local technicians office dumpster.

No snow removal was required during December as no snowfall greater than two inches occurred.

MANPOWER REPORTING

Date	LATA Labor
December 19, 2014	3 hrs.

OUTSTANDING ISSUES/RESOLUTIONS

LATA submitted the DRAFT Accident Prevention Plan for review by USACE on July 3, 2014.

PLANS FOR NEXT MONTH

Plans for the January 2015 visit includes inspection and general housekeeping activities and downloading the drainage basin level datalogger. A snow removal company has been placed under contract to remove snow from the sidewalk paralleling the Hamilton Boulevard when snowfall totals are greater than two inches. This removal will be made on an as needed basis.

Site Inspection Forms
and
Photo Log

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection being Conducted X **Monthly**

Quarterly ______ **Annually** ______ **After 1" or Greater Rainfall** ______

Inspection Date: **12/19/2014** **Weather** **Overcast, 30s**

Inspectors Name **Sunil Samaroo**

Basin Inspection:

	Yes	No	N/A
Catch Basins (23 Structures)			
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins?		X	

If yes, which catch basin(s)? ______
(Refer to Record Drawings for catch basin numbers)

Stormwater Detention Basin and Surface Sand Filter:

	Yes	No	N/A
5. Does the basin have pooled or standing water?		X	

If yes, describe where ______
6. What is the water height ______
Approximately how many hours was the last rainfall? ______
How many inches of rain? ______

	Yes	No	N/A
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin?		X	

If yes, describe where ______

	Yes	No	N/A
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?	X		

Woody vegetation was removed by pulling/cutting at ground level.

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inlet and Outlet Structures:

11. Are the five inlet and outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where ______		X	
13. Are the inlets clear of trash, sediment and debris?	X		
14. Are the outlets (standpipes, 3" Orifice, secondary outlet and emergency spillway) clear of trash, sediment, and debris?	X		
15. are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where ______		X	
16. Has vegetation been removed from inlet and outlets?			X

Additional descriptions of where repairs or maintenance is needed:

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: **12/19/2014** **Weather** **Overcast, 30s**

Inspectors Name **Sunil Samaroo**

"Tree Grove" Inspection

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe:		X	
2. Is there an accumulation of tree debris? If yes, describe:		X	
3. Do any trees appear infested? If yes, describe:			X
4. Do any trees appear malnourished? If yes, describe:			X
5. Was the last Quarterly Seasonal Maintenance Performed? Date of previous maintenance: (Refer to section 2.3.2 of the Operation & Maintenance Manual)			X
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: (Refer to section 2.3.3 of the Operation & Maintenance Manual)			X

Additional descriptions of where repairs or maintenance is needed:

Tree buffer being maintained "as is" by direction of USACE and EPA.

Inspector's Signature Sunil Samaroo

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 12/19/2014 **Weather** Overcast, 30s

Inspectors Name Sunil Samaroo

Debris, Trash, Vegetation and Sediment Removal and Inspections
Comments

Removed trash from perimeter fence.
One bag of trash, disposed of at URS dumpster.
Over all, the site remains in good condition.

General Housekeeping
Comments

Asphalt has minor cracking predominantly at seems, previously observed.

Fencing and Gates
Comments

GOOD

Trash and Debris
Comments

(See above)

Snow Removal
Comments

N/A

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Pavement Inspection (Part of Annual Inspection)

	Yes	No	N/A
1. Is there any standing water? If yes, describe where ______			X
2. Are there any signs of cracking? If so, note location and maintenance effort below.	X		
3. Are there any signs of disintegration? If so, note location and maintenance effort below.			X
4. Are there any sins of distortion? If so, note location and maintenance effort below.			X
5. Has all vegetation been removed? If applicable, note location of vegetation below	X		
6. Has usage of the site increase to a point that warrants a Pavement Condition Index (PCI) Survey?			X
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied?			X

When was date of the last CPM treatment? ______
(Refer to Section 2.2.3 of the Operations & Maintenance Manual)

Additional descriptions of where repairs or maintenance is needed:

Cracks in asphalt developing in the area of the water tower, previously observed.

Inspector's Signature Sunil Sunnarco

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Basin Drainage Rate Inspection:
(completed twice a year after a design rainfall event)

Date: ____________________

Design Rainfall Event Information
Requirements: 1.25" of rain in 2 hrs

Start: ______________________________
Stop: ______________________________
Inches of Rainfall: ______________________________

Inspection Data
Start inspections 16 hours after design rain event
Perform subsequent inspection every 2 hours until height of water drops below the to of the aggregate in the middle basin

Inspection Run #	Target time from Event (hrs)	Actual Time	Water Height (ft)
1	16		
2	18		
3	20		
4	22		
5	24		
6	26		
7	28		
8	30		
9	32		
10	34		

Note approximate time water was drained below top of sand bed and compared to the normal drain time of 21 hrs.

____

____

____
Inspector's Signature

11-13-2014 Cornell-Dubilier Electronics

Site Inspection photos

Site photos

Catch basin photos

Los Alamos Technical Associates, Inc.
756 Park Meadow Road / Westerville, Ohio 43081 / (614) 508-1200 (phone) / (614) 508-1201 (fax) / www.lata.com

January 19, 2015

Mr. Patrick Nejand
Project Manager
US Army Corps of Engineers
New York District
214 State Highway 18
East Brunswick, NJ 08816

Mr. Ken Maas
Project Manager
US Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106

SUBJECT: January 2015 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

Dear Messrs. Nejand and Maas:

Attached is the inspection report for January 2015 for the site inspection performed at the CDE site. This report details the activities completed as well as the inspection forms for the visit.

If you have any questions, please feel free call me at (614) 508-1200.

Sincerely,
LOS ALAMOS TECHNICAL ASSOCIATES, INC.

Shannon Lloyd
Sr. Project Manager

Attachments

cc: File

TO: Patrick Nejand, Project Manager
Ken Mass, Project Manager
United States Army Corps of Engineers (USACE)

FROM: Shannon Lloyd, Project Manager
Los Alamos Technical Associates, Inc. (LATA)

SUBJECT: January 2015 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

LATA Project # 11266
Contract # W912DQ-09-D-3003,
Task Order # 0011

DATE: January 19, 2015

CURRENT ACTIVITIES

LATA's technician visited the Cornell Dubilier Electronics (CDE) Superfund Site for the regularly scheduled inspection visit on January 16, 2015 to perform the routine inspection of the facilities.

Work performed during the visit included; picked up trash from the fence line, inspected the catch basin and drainage basin system, inspected the perimeter fence, gates, etc., pulled woody vegetation from accessible areas of the drainage basin, download the data from the basin dataloggers and performed a walking inspection of the asphalt cap areas. Copies of the inspection forms and photo documentation of the site visit are attached to this report.

Approximately one bag of trash (paper, plastic bottles, etc.) was picked up from around the fence line in various areas. The trash was disposed of in the local technicians office dumpster.

No snow removal was required as of this report date as no snowfall greater than two inches has occurred.

MANPOWER REPORTING

Date	LATA Labor
January 16, 2015	Approx. 3 hrs.

OUTSTANDING ISSUES/RESOLUTIONS

LATA submitted the DRAFT Accident Prevention Plan for review by USACE on July 3, 2014.

PLANS FOR NEXT MONTH

Plans for the February 2015 visit includes inspection and general housekeeping activities and downloading the drainage basin level datalogger. A snow removal company has been placed under contract to remove snow from the sidewalk paralleling the Hamilton Boulevard when snowfall totals are greater than two inches. This removal will be made on an as needed basis.

Site Inspection Forms
and
Photo Log

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection being Conducted X **Monthly**

Quarterly ______ **Annually** ______ **After 1" or Greater Rainfall** ______

Inspection Date: 1/16/2015 **Weather** Sunny, 30s

Inspectors Name Sunil Samaroo

Basin Inspection:

	Yes	No	N/A
Catch Basins (23 Structures)			
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins?		X	

If yes, which catch basin(s)? ______
(Refer to Record Drawings for catch basin numbers)

Stormwater Detention Basin and Surface Sand Filter:

	Yes	No	N/A
5. Does the basin have pooled or standing water?	X		

If yes, describe where **A think layer of ice was observed in all 3 detention basins**
6. What is the water height **< 1"**
Approximately how many hours was the last rainfall? ______
How many inches of rain? ______

	Yes	No	N/A
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin?		X	

If yes, describe where ______

	Yes	No	N/A
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?	X		

Woody vegetation was removed by pulling/cutting at ground level.

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inlet and Outlet Structures:

11. Are the five inlet and outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where ____________		X	
13. Are the inlets clear of trash, sediment and debris?	X		
14. Are the outlets (standpipes, 3" Orifice, secondary outlet and emergency spillway) clear of trash, sediment, and debris?	X		
15. are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where ____________		X	
16. Has vegetation been removed from inlet and outlets?			X

Additional descriptions of where repairs or maintenance is needed:

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: **1/16/2015** **Weather** **Sunny, 30s**

Inspectors Name **Sunil Samaroo**

"Tree Grove" Inspection

Question	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe:		X	
2. Is there an accumulation of tree debris? If yes, describe:		X	
3. Do any trees appear infested? If yes, describe:			X
4. Do any trees appear malnourished? If yes, describe:			X
5. Was the last Quarterly Seasonal Maintenance Performed? Date of previous maintenance: (Refer to section 2.3.2 of the Operation & Maintenance Manual)			X
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: (Refer to section 2.3.3 of the Operation & Maintenance Manual)			X

Additional descriptions of where repairs or maintenance is needed:

Tree buffer being maintained "as is" by direction of USACE and EPA.

Inspector's Signature Sunil Samaroo

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 1/16/2015 **Weather** Sunny, 30s

Inspectors Name Sunil Samaroo

Debris, Trash, Vegetation and Sediment Removal and Inspections
Comments

Removed trash from perimeter fence.
One bag of trash, disposed of at URS dumpster.
Over all, the site remains in good condition.

General Housekeeping
Comments

Asphalt has minor cracking predominantly at seems, previously observed.

Fencing and Gates
Comments

GOOD

Trash and Debris
Comments

(See above)

Snow Removal
Comments

N/A

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Pavement Inspection (Part of Annual Inspection)

	Yes	No	N/A
1. Is there any standing water? If yes, describe where ______			X
2. Are there any signs of cracking? If so, note location and maintenance effort below.	X		
3. Are there any signs of disintegration? If so, note location and maintenance effort below.			X
4. Are there any sins of distortion? If so, note location and maintenance effort below.			X
5. Has all vegetation been removed? If applicable, note location of vegetation below	X		
6. Has usage of the site increase to a point that warrants a Pavement Condition Index (PCI) Survey?			X
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied?			X

When was date of the last CPM treatment? ______
(Refer to Section 2.2.3 of the Operations & Maintenance Manual)

Additional descriptions of where repairs or maintenance is needed:

Cracks in asphalt developing in the area of the water tower, previously observed.

Inspector's Signature Sunil Sunnarao

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Basin Drainage Rate Inspection:
(completed twice a year after a design rainfall event)

Date: ____________________

Design Rainfall Event Information
Requirements: 1.25" of rain in 2 hrs

Start: ______________________________
Stop: ______________________________
Inches of Rainfall: ______________________________

Inspection Data
Start inspections 16 hours after design rain event
Perform subsequent inspection every 2 hours until height of water drops below the to of the aggregate in the middle basin

Inspection Run #	Target time from Event (hrs)	Actual Time	Water Height (ft)
1	16		
2	18		
3	20		
4	22		
5	24		
6	26		
7	28		
8	30		
9	32		
10	34		

Note approximate time water was drained below top of sand bed and compared to the normal drain time of 21 hrs.

____

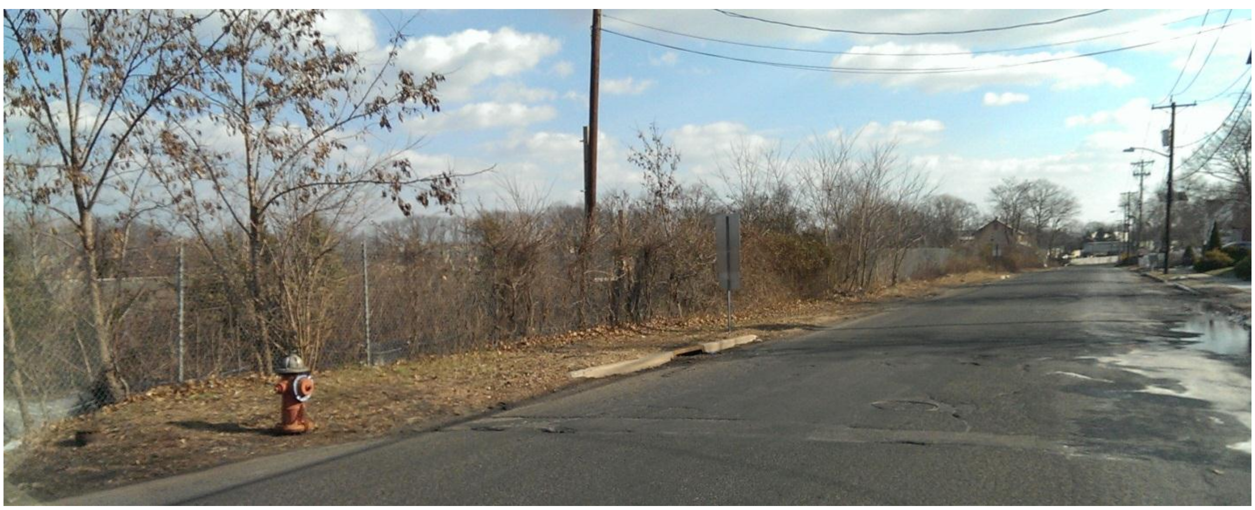
____

____
Inspector's Signature

01-16-2015 Cornell-Dubilier Electronics

Site Inspection photos

Fence drive by inspection photos



Additional site photos

Los Alamos Technical Associates, Inc.

756 Park Meadow Road / Westerville, Ohio 43081 / (614) 508-1200 (phone) / (614) 508-1201 (fax) / www.lata.com

February 19, 2015

Mr. Patrick Nejand
Project Manager
US Army Corps of Engineers
New York District
214 State Highway 18
East Brunswick, NJ 08816

Mr. Ken Maas
Project Manager
US Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106

SUBJECT: February 2015 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

Dear Messrs. Nejand and Maas:

Attached is the inspection report for February 2015 for the site inspection performed at the CDE site. This report details the activities completed as well as the inspection forms for the visit.

If you have any questions, please feel free call me at (614) 508-1200.

Sincerely,
LOS ALAMOS TECHNICAL ASSOCIATES, INC.

Shannon Lloyd
Sr. Project Manager

Attachments

cc: File

TO: Patrick Nejand, Project Manager
Ken Mass, Project Manager
United States Army Corps of Engineers (USACE)

FROM: Shannon Lloyd, Project Manager
Los Alamos Technical Associates, Inc. (LATA)

SUBJECT: February 2015 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

LATA Project # 11266
Contract # W912DQ-09-D-3003,
Task Order # 0011

DATE: February 19, 2015

CURRENT ACTIVITIES

LATA's technician visited the Cornell Dubilier Electronics (CDE) Superfund Site for the regularly scheduled inspection visit on February 13, 2015 to perform the routine inspection of the facilities.

Work performed during the visit included; picked up trash from the fence line, inspected the catch basin and drainage basin system, inspected the perimeter fence, gates, etc., pulled woody vegetation from accessible areas of the drainage basin, download the data from the basin dataloggers and performed a walking inspection of the asphalt cap areas. Copies of the inspection forms and photo documentation of the site visit are attached to this report. Snow removal and clearing of the sidewalk paralleling Hamilton Boulevard was completed as needed during the month.

Approximately one bag of trash (paper, plastic bottles, etc.) was picked up from around the fence line in various areas. The trash was disposed of in the local technicians office dumpster.

MANPOWER REPORTING

Date	LATA Labor
February 13, 2015	Approx. 3 hrs.

OUTSTANDING ISSUES/RESOLUTIONS

None

PLANS FOR NEXT MONTH

Plans for the March 2015 visit includes inspection and general housekeeping activities and downloading the drainage basin level datalogger. A snow removal company has been placed under contract to remove snow from the sidewalk paralleling the Hamilton Boulevard when snowfall totals are greater than two inches. This removal will be made on an as needed basis.

Site Inspection Forms
and
Photo Log

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection being Conducted X **Monthly**

Quarterly ______ **Annually** ______ **After 1" or Greater Rainfall** ______

Inspection Date: 2/13/2015 **Weather** Sunny, 20s

Inspectors Name Sunil Samaroo

Basin Inspection:

Catch Basins (23 Structures)

	Yes	No	N/A
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins?		X	

If yes, which catch basin(s)? ______
(Refer to Record Drawings for catch basin numbers)

Stormwater Detention Basin and Surface Sand Filter:

	Yes	No	N/A
5. Does the basin have pooled or standing water?	X		

If yes, describe where **A thin layer of ice was observed in all 3 detention basins**
6. What is the water height **~ 1"**
Approximately how many hours was the last rainfall? ______
How many inches of rain? ______

	Yes	No	N/A
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin?		X	

If yes, describe where ______

	Yes	No	N/A
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?			X

Woody vegetation was removed by pulling/cutting at ground level.

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inlet and Outlet Structures:

11. Are the five inlet and outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where ____________________		X	
13. Are the inlets clear of trash, sediment and debris?	X		
14. Are the outlets (standpipes, 3" Orifice, secondary outlet and emergency spillway) clear of trash, sediment, and debris?	X		
15. are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where ____________________		X	
16. Has vegetation been removed from inlet and outlets?			X

Additional descriptions of where repairs or maintenance is needed:

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: **2/13/2015** **Weather** **Sunny, 20s**

Inspectors Name **Sunil Samaroo**

"Tree Grove" Inspection

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe:		X	
2. Is there an accumulation of tree debris? If yes, describe:		X	
3. Do any trees appear infested? If yes, describe:			X
4. Do any trees appear malnourished? If yes, describe:			X
5. Was the last Quarterly Seasonal Maintenance Performed? Date of previous maintenance: (Refer to section 2.3.2 of the Operation & Maintenance Manual)			X
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: (Refer to section 2.3.3 of the Operation & Maintenance Manual)			X

Additional descriptions of where repairs or maintenance is needed:

Tree buffer being maintained "as is" by direction of USACE and EPA.

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 2/13/2015 **Weather** Sunny, 20s

Inspectors Name Sunil Samaroo

Debris, Trash, Vegetation and Sediment Removal and Inspections
Comments

Removed trash from perimeter fence.
One bag of trash (< 1/2 of bag) disposed of at URS dumpster.
Over all, the site remains in good condition.

General Housekeeping
Comments

Asphalt has minor cracking predominantly at seems, previously observed.

Fencing and Gates
Comments

GOOD

Trash and Debris
Comments

(See above)

Snow Removal
Comments

N/A

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Pavement Inspection (Part of Annual Inspection)

	Yes	No	N/A
1. Is there any standing water? If yes, describe where ______			X
2. Are there any signs of cracking? If so, note location and maintenance effort below.	X		
3. Are there any signs of disintegration? If so, note location and maintenance effort below.			X
4. Are there any sins of distortion? If so, note location and maintenance effort below.			X
5. Has all vegetation been removed? If applicable, note location of vegetation below	X		
6. Has usage of the site increase to a point that warrants a Pavement Condition Index (PCI) Survey?			X
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied?			X

When was date of the last CPM treatment? ______
(Refer to Section 2.2.3 of the Operations & Maintenance Manual)

Additional descriptions of where repairs or maintenance is needed:

Cracks in asphalt developing in the area of the water tower, previously observed.

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Basin Drainage Rate Inspection:
(completed twice a year after a design rainfall event)

Date: ____________________

Design Rainfall Event Information
Requirements: 1.25" of rain in 2 hrs

Start: ____________________
Stop: ____________________
Inches of Rainfall: ____________________

Inspection Data
Start inspections 16 hours after design rain event
Perform subsequent inspection every 2 hours until height of water drops below the to of the aggregate in the middle basin

Inspection Run #	Target time from Event (hrs)	Actual Time	Water Height (ft)
1	16		
2	18		
3	20		
4	22		
5	24		
6	26		
7	28		
8	30		
9	32		
10	34		

Note approximate time water was drained below top of sand bed and compared to the normal drain time of 21 hrs.

Inspector's Signature

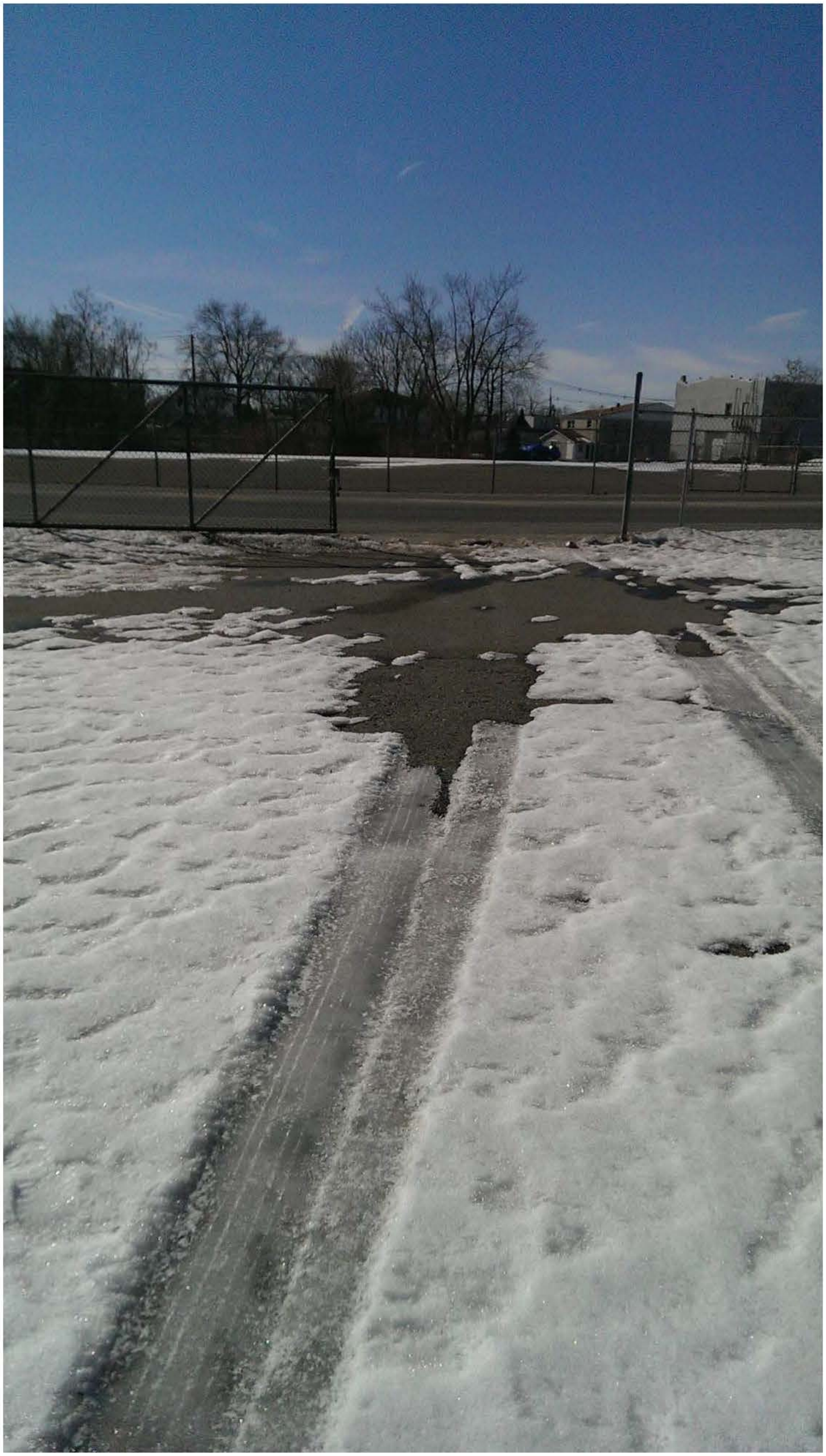
02-13-2015 Cornell-Dubilier Electronics

Site Inspection photos

Fence drive by inspection photos

Additional site photos

(Rolling gate along Spicer Avenue was open when getting on-site)



Los Alamos Technical Associates, Inc.

756 Park Meadow Road / Westerville, Ohio 43081 / (614) 508-1200 (phone) / (614) 508-1201 (fax) / www.lata.com

March 20, 2015

Mr. Patrick Nejand
Project Manager
US Army Corps of Engineers
New York District
214 State Highway 18
East Brunswick, NJ 08816

Mr. Ken Maas
Project Manager
US Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106

SUBJECT: March 2015 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

Dear Messrs. Nejand and Maas:

Attached is the monthly report for March 2015 for the site inspection performed at the CDE site. This report details the activities completed as well as the inspection forms for the visit.

If you have any questions, please feel free call me at (614) 508-1200.

Sincerely,
LOS ALAMOS TECHNICAL ASSOCIATES, INC.

Nathan Canaris
Project Manager

Attachments

cc: File

TO: Patrick Nejand, Project Manager
Ken Mass, Project Manager
United States Army Corps of Engineers (USACE)

FROM: Nathan Canaris, Project Manager
Los Alamos Technical Associates, Inc. (LATA)

SUBJECT: March 2015 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

LATA Project # 11266
Contract # W912DQ-09-D-3003,
Task Order # 0011

DATE: March 20, 2015

CURRENT ACTIVITIES

LATA's technician visited the Cornell Dubilier Electronics (CDE) Superfund Site for the regularly scheduled inspection visit on March 19, 2015 to perform the routine inspection of the facilities.

Work performed during the visit included; picked up trash from the fence line, inspected the catch basin and drainage basin system, inspected the perimeter fence, gates, etc., pulled woody vegetation from accessible areas of the drainage basin, downloaded the data from the basin dataloggers and performed a walking inspection of the asphalt cap areas. Copies of the inspection forms and photo documentation of the site visit are attached to this report. Snow removal and clearing of the sidewalk paralleling Hamilton Boulevard was completed as needed during the month.

Approximately one bag of trash (paper, plastic bottles, etc.) was picked up from around the fence line in various areas. The trash was disposed of in the local technician's office dumpster.

MANPOWER REPORTING

Date	LATA Labor
March 19, 2015	Approx. 3 hrs.

OUTSTANDING ISSUES/RESOLUTIONS

None

PLANS FOR NEXT MONTH

Plans for the April 2015 visit includes inspection and general housekeeping activities and downloading the drainage basin level datalogger. A snow removal company has been placed under contract to remove snow from the sidewalk paralleling the Hamilton Boulevard when snowfall totals are greater than two inches. This removal will be made on an as needed basis.

Site Inspection Forms
and
Photo Log

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection being Conducted X **Monthly**

Quarterly ______ **Annually** ______ **After 1" or Greater Rainfall** ______

Inspection Date: **3/19/2015** **Weather** **Sunny, 30s**

Inspectors Name **Sunil Samaroo**

Basin Inspection:

Catch Basins (23 Structures)

	Yes	No	N/A
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins?		X	

If yes, which catch basin(s)? ______
(Refer to Record Drawings for catch basin numbers)

Stormwater Detention Basin and Surface Sand Filter:

	Yes	No	N/A
5. Does the basin have pooled or standing water?	X		

If yes, describe where **Water and ice was observed in all 3 detention basins**
6. What is the water height **3" to 4"**
Approximately how many hours was the last rainfall? ______
How many inches of rain? ______

	Yes	No	N/A
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin?		X	

If yes, describe where ______

	Yes	No	N/A
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?			X

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inlet and Outlet Structures:

11. Are the five inlet and outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where ______		X	
13. Are the inlets clear of trash, sediment and debris?	X		
14. Are the outlets (standpipes, 3" Orifice, secondary outlet and emergency spillway) clear of trash, sediment, and debris?	X		
15. are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where ______		X	
16. Has vegetation been removed from inlet and outlets?			X

Additional descriptions of where repairs or maintenance is needed:

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: **3/19/2015** **Weather** **Sunny, 30s**

Inspectors Name **Sunil Samaroo**

"Tree Grove" Inspection

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe:		X	
2. Is there an accumulation of tree debris? If yes, describe:		X	
3. Do any trees appear infested? If yes, describe:			X
4. Do any trees appear malnourished? If yes, describe:			X
5. Was the last Quarterly Seasonal Maintenance Performed? Date of previous maintenance: (Refer to section 2.3.2 of the Operation & Maintenance Manual)			X
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: (Refer to section 2.3.3 of the Operation & Maintenance Manual)			X

Additional descriptions of where repairs or maintenance is needed:

Tree buffer being maintained "as is" by direction of USACE and EPA.

Inspector's Signature Sunil Samaroo

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 3/19/2015 **Weather** Sunny, 30s

Inspectors Name Sunil Samaroo

Debris, Trash, Vegetation and Sediment Removal and Inspections
Comments
Removed trash from perimeter fence.
One bag of trash, disposed of at URS dumpster.
Over all, the site remains in good condition.

General Housekeeping
Comments
Asphalt has minor cracking predominantly at seems, previously observed.

Fencing and Gates
Comments
GOOD

Trash and Debris
Comments
(See above)

Snow Removal
Comments
N/A

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Pavement Inspection (Part of Annual Inspection)

	Yes	No	N/A
1. Is there any standing water? If yes, describe where ________________			X
2. Are there any signs of cracking? If so, note location and maintenance effort below.	X		
3. Are there any signs of disintegration? If so, note location and maintenance effort below.			X
4. Are there any sins of distortion? If so, note location and maintenance effort below.			X
5. Has all vegetation been removed? If applicable, note location of vegetation below	X		
6. Has usage of the site increase to a point that warrants a Pavement Condition Index (PCI) Survey?			X
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied?			X

When was date of the last CPM treatment? ________________
(Refer to Section 2.2.3 of the Operations & Maintenance Manual)

Additional descriptions of where repairs or maintenance is needed:

Cracks in asphalt developing in the area of the water tower, previously observed.

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Basin Drainage Rate Inspection:
(completed twice a year after a design rainfall event)

Date: ____________________

Design Rainfall Event Information
Requirements: 1.25" of rain in 2 hrs

Start: ______________________________
Stop: ______________________________
Inches of Rainfall: ______________________________

Inspection Data
Start inspections 16 hours after design rain event
Perform subsequent inspection every 2 hours until height of water drops below the to of the aggregate in the middle basin

Inspection Run #	Target time from Event (hrs)	Actual Time	Water Height (ft)
1	16		
2	18		
3	20		
4	22		
5	24		
6	26		
7	28		
8	30		
9	32		
10	34		

Note approximate time water was drained below top of sand bed and compared to the normal drain time of 21 hrs.

____

____

____
Inspector's Signature

03-19-2015 Cornell-Dubilier Electronics

Site Inspection photos

Fence drive by inspection photos


FOR SALE
BY OWNER

Additional site photos

Los Alamos Technical Associates, Inc.

756 Park Meadow Road / Westerville, Ohio 43081 / (614) 508-1200 (phone) / (614) 508-1201 (fax) / www.lata.com

May 1, 2015

Mr. Patrick Nejand
Project Manager
US Army Corps of Engineers
New York District
214 State Highway 18
East Brunswick, NJ 08816

Mr. Ken Maas
Project Manager
US Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106

SUBJECT: April 2015 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

Dear Messrs. Nejand and Maas:

Attached is the monthly report for April 2015 for the site inspection and pavement repairs performed at the CDE site. This report details the activities completed as well as the inspection forms for the visit.

If you have any questions, please feel free call me at (614) 508-1200.

Sincerely,
LOS ALAMOS TECHNICAL ASSOCIATES, INC.

Nathan Canaris
Project Manager

Attachments
Site Inspection Forms and Photo Log
Pavement Repair Activities Photo Log
Deery 5078 Hot Applied Sealant Specifications
Detention Basin Water Level and Precipitation Chart

cc: File

TO: Patrick Nejand, Project Manager
Ken Mass, Project Manager
United States Army Corps of Engineers (USACE)

FROM: Nathan Canaris, Project Manager
Los Alamos Technical Associates, Inc. (LATA)

SUBJECT: April 2015 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

LATA Project # 11266
Contract # W912DQ-09-D-3003,
Task Order # 0011

DATE: May 1, 2015

CURRENT ACTIVITIES

LATA's technician visited the Cornell Dubilier Electronics (CDE) Superfund Site for the regularly scheduled inspection visit on April 27, 2015 to perform the routine inspection of the facilities.

Work performed during the visit included; picked up trash from the fence line, inspected the catch basin and drainage basin system, inspected the perimeter fence, gates, etc., pulled woody vegetation from accessible areas of the drainage basin, cleared brush from the southeastern perimeter fence and downloaded the data from the basin dataloggers. Copies of the inspection forms and photo documentation of the site visit are attached to this report.

Approximately three bags of trash (paper, plastic bottles, etc.) were picked up from around the fence line in various areas. The trash was disposed of in the local technician's office dumpster.

LATA met with USACE and USEPA on April 27, 2015 to review the condition of the pavement at the site and discuss expectations for the pavement repair activities. Three members of LATA's asphalt contractor were on-site to begin pavement repair activities. Deery 5078 Hot Applied Sealant (see attachment for material specifications) was applied to 6,730 linear feet of cracks in the pavement. A second layer of material was applied to 1,109 linear feet of deeper cracks in an effort to completely seal the crack.

LATA was on-site with the asphalt contractor on April 28, 2015 to continue with pavement repair activities. Deery 5078 Hot Applied Sealant was applied to 1,393 linear feet of cracks in the pavement. From one to four additional layers of material were applied over a total of 9,081 linear feet of deeper cracks in an effort to completely seal the crack. The attached photo log for pavement repair activities shows how deeper cracks were filled with additional layers of material.

Also attached with this report is a chart summarizing the water level in the detention basis along with precipitation data. The water level data is recorded using a barometrically compensated Solinst® level logger which was installed in the detention basin in September 2014. The precipitation data is provided by the USGS from a heated rain gauge located approximately five miles from the site in Middlesex, NJ. Since installation of the level logger, no rainfall events have occurred which met the design rainfall event criteria of 1.25 inches of rain in a two hour period.

MANPOWER REPORTING

Date	LATA Labor
April 27, 2015	36 hrs.
April 28, 2015	34 hrs.

OUTSTANDING ISSUES/RESOLUTIONS

None

PLANS FOR NEXT MONTH

Plans for the May 2015 visit includes inspection and general housekeeping activities and downloading the drainage basin level datalogger.

Site Inspection Forms
and
Photo Log

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection being Conducted X **Monthly**

Quarterly ________ **Annually** ________ **After 1" or Greater Rainfall** ________

Inspection Date: 4/27/2015 **Weather** Overcast, 50s

Inspectors Name Sunil Samaroo

Basin Inspection:

Catch Basins (23 Structures)

	Yes	No	N/A
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins?		X	

If yes, which catch basin(s)? ________
(Refer to Record Drawings for catch basin numbers)

Stormwater Detention Basin and Surface Sand Filter:

	Yes	No	N/A
5. Does the basin have pooled or standing water?	X		

If yes, describe where **Water was observed in 1 of 3 detention basins**
6. What is the water height **Less than 1"**
Approximately how many hours was the last rainfall? ________
How many inches of rain? ________

	Yes	No	N/A
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin?		X	

If yes, describe where ________

	Yes	No	N/A
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?			X

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inlet and Outlet Structures:

11. Are the five inlet and outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where ______		X	
13. Are the inlets clear of trash, sediment and debris?	X		
14. Are the outlets (standpipes, 3" Orifice, secondary outlet and emergency spillway) clear of trash, sediment, and debris?	X		
15. are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where ______		X	
16. Has vegetation been removed from inlet and outlets?			X

Additional descriptions of where repairs or maintenance is needed:

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: **4/27/2015** **Weather** **Overcast, 50s**

Inspectors Name **Sunil Samaroo**

"Tree Grove" Inspection

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe:		X	
2. Is there an accumulation of tree debris? If yes, describe:		X	
3. Do any trees appear infested? If yes, describe:			X
4. Do any trees appear malnourished? If yes, describe:			X
5. Was the last Quarterly Seasonal Maintenance Performed? Date of previous maintenance: (Refer to section 2.3.2 of the Operation & Maintenance Manual)			X
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: (Refer to section 2.3.3 of the Operation & Maintenance Manual)			X

Additional descriptions of where repairs or maintenance is needed:

Tree buffer being maintained "as is" by direction of USACE and EPA.

Inspector's Signature Sunil Samaroo

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 4/27/2015 **Weather** Overcast, 50s

Inspectors Name Sunil Samaroo

Debris, Trash, Vegetation and Sediment Removal and Inspections
Comments

Removed trash from perimeter fence.
Three bags of trash, disposed of at URS dumpster.
Over all, the site remains in good condition.

General Housekeeping
Comments

Asphalt has minor cracking predominantly at seems, previously observed.
Subcontractor on-site with LATA representative, N. Canaris, performing repairs.

Fencing and Gates
Comments

GOOD

Trash and Debris
Comments

(See above)

Snow Removal
Comments

N/A

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Pavement Inspection (Part of Annual Inspection)

	Yes	No	N/A
1. Is there any standing water? If yes, describe where			X
2. Are there any signs of cracking? If so, note location and maintenance effort below.	X		
3. Are there any signs of disintegration? If so, note location and maintenance effort below.			X
4. Are there any sins of distortion? If so, note location and maintenance effort below.			X
5. Has all vegetation been removed? If applicable, note location of vegetation below	X		
6. Has usage of the site increase to a point that warrants a Pavement Condition Index (PCI) Survey?			X
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied?	X		

When was date of the last CPM treatment? **4/27/15 through 4/28/15**
(Refer to Section 2.2.3 of the Operations & Maintenance Manual)

Additional descriptions of where repairs or maintenance is needed:

Cracks in asphalt developing in the area of the water tower, previously observed.

Subcontractor on-site with LATA representative, N. Canaris, performing repairs.

Inspector's Signature Sunil Sunnarco

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Basin Drainage Rate Inspection:
(completed twice a year after a design rainfall event)

Date: ____________________

Design Rainfall Event Information
Requirements: 1.25" of rain in 2 hrs

Start: ______________________________
Stop: ______________________________
Inches of Rainfall: ______________________________

Inspection Data
Start inspections 16 hours after design rain event
Perform subsequent inspection every 2 hours until height of water drops below the to of the aggregate in the middle basin

Inspection Run #	Target time from Event (hrs)	Actual Time	Water Height (ft)
1	16		
2	18		
3	20		
4	22		
5	24		
6	26		
7	28		
8	30		
9	32		
10	34		

Note approximate time water was drained below top of sand bed and compared to the normal drain time of 21 hrs.

____

____

____
Inspector's Signature

04-27-2015 Cornell-Dubilier Electronics

Overcast, 50s

Site Inspection photos

Fence drive by inspection photos


FOR SALE
BY OWNER

Additional site photos

Pavement Repair Activities
Photo Log

Pavement cracks prior to repairs. This crack was located on the north end of the property. The picture on the left shows the western end of the crack. The picture on the right shows the eastern of the same crack.

Pavement cracks prior to repairs. The crack on the left was located on the north end of the property, east of the water tower. The crack on the right was located near the south end of the property.

Pavement cracks prior to repairs. The crack on the left was located near the south end of the property. The crack on the right was located outside the fence around the southern side of the detention basins.

Pavement crack prior to repairs. This crack was located west of the detention basins.

Asphalt contractors and equipment.

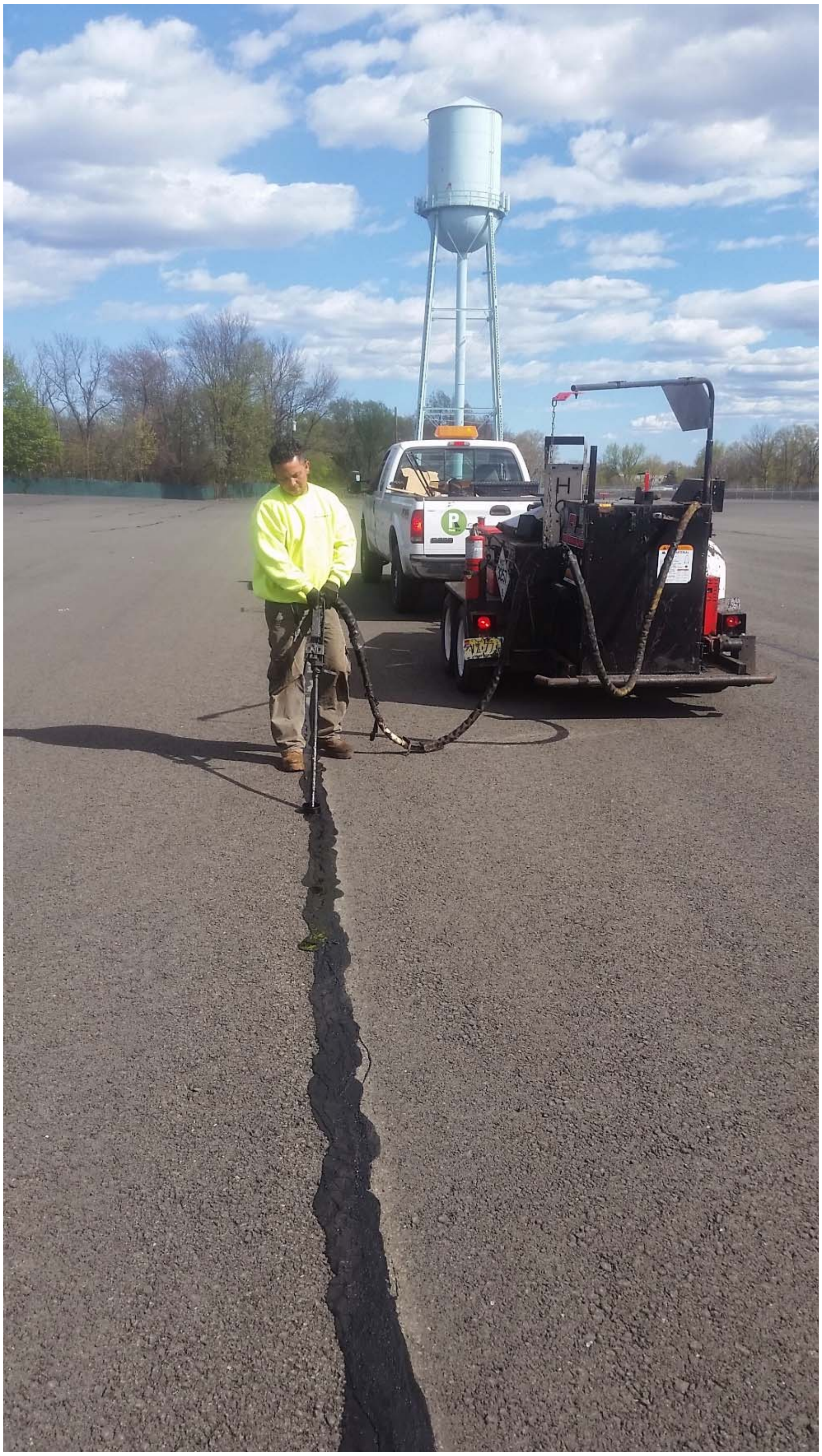
Application of Deery 5078 Hot Applied Sealant to cracks in pavement.

Asphalt contractors applying material to cracks in pavement on the north side of the property.

Same crack after first (left) and second (right) application of material. Located on the south side of the property, sealing of this crack was completed after the third application.

Same crack after first, second and third application of material. Located on the south side of the property, sealing of this crack was completed after the third application.

Same crack after second (left) and fourth (right) application of material. Located on the south side of the property, sealing of this crack was completed after the fourth application.



Complete sealing of this crack on the north side of the property required five applications of material.

Located on the south side of the property, these cracks received two applications of material.

Pavement cracks after final application of material.

Pavement cracks after final application of material.

Deery 5078 Hot Applied Sealant Specifications

DEERY® 5078

PAVEMENT PRESERVATION PRODUCTS

HOT APPLIED SEALANT, Part No. 85078

PRODUCT DATA SHEET
APRIL 2011

DESCRIPTION DEERY 5078 is a hot applied, single component, elastically modified composition of asphalt cement, virgin synthetic polymer, recycled rubber, and other modifiers. The sealant contains no solvent, is pre-reacted and conforms to and exceeds the requirements of **ASTM D5078**. VOC=0 g/l.

USE DEERY 5078 is a moderately high viscosity pavement preservation sealant intended for highway, street and aviation applications for sealing longitudinal and transverse joints and random cracks in Asphalt or Concrete pavements where use of high levels of recycled material is desirable. Properly installed, DEERY 5078 is an effective barrier against damage from debris and moisture infiltration into cracks and joints within regions experiencing moderate high and low pavement temperatures.

HEATING Sealant shall be heated in a hot-oil jacketed melter capable of constant mechanical agitation and equipped with a calibrated thermometer to monitor sealant temperature. Material shall be heated to and maintained at Recommended Application Temperature during use. Material can be cooled and then reheated, but only if prolonged heating is avoided. Prolonged heating at or above Recommended Application Temperature may severely damage product. If overheating damage occurs, immediately drain machine completely and refill with new material.

APPLICATION DEERY 5078 is pre-reacted and can be applied immediately after heating to Recommended Application Temperature. With pavement temperature at 40°F (4°C) or higher, place material into clean, dry crack or prepared reservoir by means of a hand-held pour pot, wheeled push bander or wand applicator. Squeegee any excess sealant tight to pavement surface. Pavement may be warmed to 40°F (4°C) or higher with a Hot Air Lance.

PROPERTIES of DEERY 5078
When sampled and heated to maximum heating temperature in accordance with ASTM D5167

TEST	METHOD	SPECIFICATION
Cone Penetration @ 77°F (25°C)	ASTM D5329	70 maximum
Cone Penetration @ 39.2ºF (4ºC)	ASTM D5329	15 minimum
Resilience @ 77°F (25°C)	ASTM D5329	30% minimum
Softening Point	ASTM D36	150°F (66°C) minimum
Crumb Rubber Content		10-25%
Asphalt Compatibility	ASTM D5329	Pass
Recommended Application Temperature	ASTM D5167	380-400°F (193-204°C)*
Maximum Heating Temperature	ASTM D6690	400°F (204°C)

*Temperature of product measured at pavement surface. Use highest Recommended Application Temperature in cool weather.
*Prolonged heating at or above Recommended Application Temperature may severely damage product.

PACKAGING Material is packaged in cardboard boxes sized to accommodate a maximum of 40 lb (18.0 kg). Material contained in each box is wrapped in a quick melt liner which is dissolved and incorporated into the melted product. Standard packaging is 30 lb (13.6 kg) per box, palletized 75 boxes per pallet with an approximate net weight of 2,250 lb (1,021.0 kg). Pallets are moisture protected with a plastic wrapping and bound with a minimum of two layers of UV resistant stretch wrap.

FOR ADDITIONAL INFORMATION

Call:1-800-227-4059 toll free
Email:info@deeryamerican.com
Web: www.deeryamerican.com

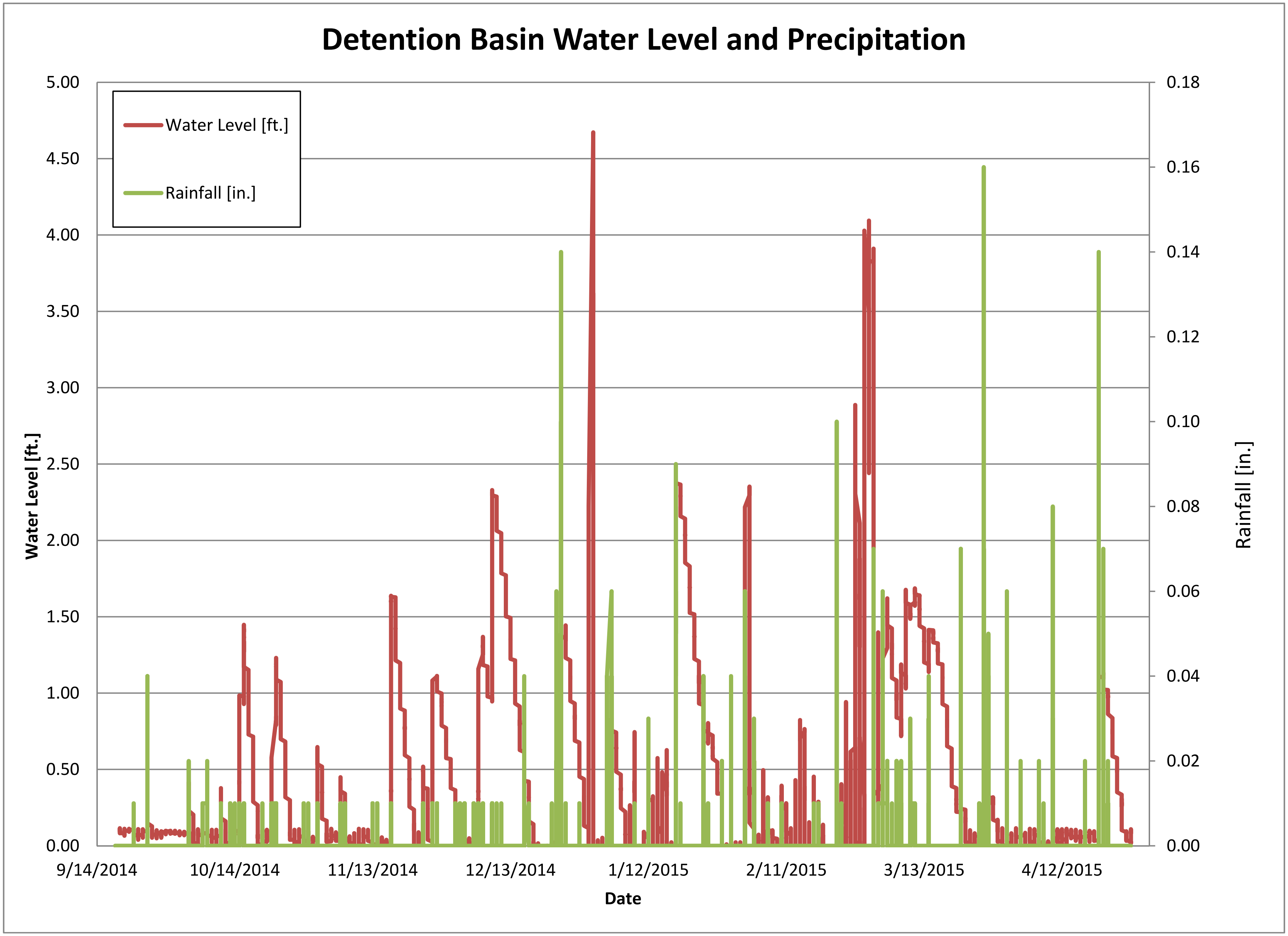
PERFORMANCE Temperature fluctuations, site conditions, surface preparation, traffic, installation technique, material selection, shape factor and surface treatment compatibility influence the effectiveness and useful life of Pavement Preservation treatments. Consider and monitor each element for optimum results. Purchaser and end user should determine applicability for use in their specific conditions.

WARRANTY Manufacturer warrants that these products meet applicable ASTM, AASHTO, Federal or State specifications at time of shipment. Techniques used for the preparation of the cracks and joints prior to sealing or filling are beyond our control as are the use and application of the products; therefore, manufacturer shall not be responsible for improperly applied or misused products. Remedies against manufacturer, as agreed to by manufacturer, are limited to replacing nonconforming product or refund (full or partial) of purchase price from manufacturer. All claims for breach of this warranty must be made within three (3) months of the date of use or twelve (12) months from the date of delivery by manufacturer, whichever is earlier. There shall be no other warranties expressed or implied. **For optimum performance, follow manufacturer recommendations for product installation.**

CRAFCO INC
AN ERGON COMPANY

420 N. Roosevelt Ave. • Chandler AZ 85226
1-800-528-8242 • (602) 276-0406 • FAX (480) 961-0513
www.crafco.com

Detention Basin Water Level and Precipitation Chart



Detention Basin Water Level and Precipitation
Water Level [ft.]
Rainfall [in.]
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
9/14/2014
10/14/2014
11/13/2014
12/13/2014
1/12/2015
2/11/2015
3/13/2015
4/12/2015
Date
Water Level [ft.]
Rainfall [in.]

Los Alamos Technical Associates, Inc.

756 Park Meadow Road / Westerville, Ohio 43081 / (614) 508-1200 (phone) / (614) 508-1201 (fax) / www.lata.com

June 2, 2015

Mr. Patrick Nejand
Project Manager
US Army Corps of Engineers
New York District
214 State Highway 18
East Brunswick, NJ 08816

Mr. Ken Maas
Project Manager
US Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106

SUBJECT: May 2015 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

Dear Messrs. Nejand and Maas:

Attached is the monthly report for May 2015 for the site inspection performed at the CDE site. This report details the activities completed as well as the inspection forms for the visit.

If you have any questions, please feel free call me at (614) 508-1200.

Sincerely,
LOS ALAMOS TECHNICAL ASSOCIATES, INC.

Nathan Canaris
Project Manager

Attachments

cc: File

TO: Patrick Nejand, Project Manager
Ken Mass, Project Manager
United States Army Corps of Engineers (USACE)

FROM: Nathan Canaris, Project Manager
Los Alamos Technical Associates, Inc. (LATA)

SUBJECT: May 2015 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

LATA Project # 11266
Contract # W912DQ-09-D-3003,
Task Order # 0011

DATE: June 2, 2015

CURRENT ACTIVITIES

LATA's technician visited the Cornell Dubilier Electronics (CDE) Superfund Site for the regularly scheduled inspection visit on May 22, 2015 to perform the routine inspection of the facilities.

Work performed during the visit included; picked up trash from the fence line, inspected the catch basin and drainage basin system, inspected the perimeter fence, gates, etc., pulled woody vegetation from accessible areas of the drainage basin, downloaded the data from the basin dataloggers and performed a walking inspection of the asphalt cap areas. Copies of the inspection forms and photo documentation of the site visit are attached to this report.

Two bags of trash (paper, plastic bottles, etc.) were picked up from around the fence line in various areas. The trash was disposed of in the local technician's office dumpster.

MANPOWER REPORTING

Date	LATA Labor
May 22, 2015	Approx. 2 hrs.

OUTSTANDING ISSUES/RESOLUTIONS

None

PLANS FOR NEXT MONTH

Plans for the June 2015 visit includes inspection and general housekeeping activities and downloading the drainage basin level datalogger.

Site Inspection Forms
and
Photo Log

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection being Conducted X **Monthly**

Quarterly ______ **Annually** ______ **After 1" or Greater Rainfall** ______

Inspection Date: 5/22/2015 **Weather** Sunny, 60s

Inspectors Name Sunil Samaroo

Basin Inspection:

Catch Basins (23 Structures)

	Yes	No	N/A
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins?		X	

If yes, which catch basin(s)? ______
(Refer to Record Drawings for catch basin numbers)

Stormwater Detention Basin and Surface Sand Filter:

	Yes	No	N/A
5. Does the basin have pooled or standing water?		X	

If yes, describe where ______
6. What is the water height ______
Approximately how many hours was the last rainfall? ______
How many inches of rain? ______

	Yes	No	N/A
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin?		X	

If yes, describe where ______

	Yes	No	N/A
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?			X

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inlet and Outlet Structures:

11. Are the five inlet and outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where ______		X	
13. Are the inlets clear of trash, sediment and debris?	X		
14. Are the outlets (standpipes, 3" Orifice, secondary outlet and emergency spillway) clear of trash, sediment, and debris?	X		
15. are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where ______		X	
16. Has vegetation been removed from inlet and outlets?			X

Additional descriptions of where repairs or maintenance is needed:

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: **5/22/2015** **Weather** **Sunny, 60s**

Inspectors Name **Sunil Samaroo**

"Tree Grove" Inspection

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe:		X	
2. Is there an accumulation of tree debris? If yes, describe:		X	
3. Do any trees appear infested? If yes, describe:			X
4. Do any trees appear malnourished? If yes, describe:			X
5. Was the last Quarterly Seasonal Maintenance Performed? Date of previous maintenance: (Refer to section 2.3.2 of the Operation & Maintenance Manual)			X
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: (Refer to section 2.3.3 of the Operation & Maintenance Manual)			X

Additional descriptions of where repairs or maintenance is needed:

Tree buffer being maintained "as is" by direction of USACE and EPA.

Inspector's Signature Sunil Samaroo

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 5/22/2015 **Weather** Sunny, 60s

Inspectors Name Sunil Samaroo

Debris, Trash, Vegetation and Sediment Removal and Inspections
Comments

Removed trash from perimeter fence.
Two bags of trash, disposed of at URS dumpster.
Over all, the site remains in good condition.

General Housekeeping
Comments

Asphalt has minor cracking predominantly at seems, previously observed.

Fencing and Gates
Comments

Good

Trash and Debris
Comments

(See above)

Snow Removal
Comments

N/A

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Pavement Inspection (Part of Annual Inspection)

	Yes	No	N/A
1. Is there any standing water? If yes, describe where ______			X
2. Are there any signs of cracking? If so, note location and maintenance effort below.	X		
3. Are there any signs of disintegration? If so, note location and maintenance effort below.			X
4. Are there any sins of distortion? If so, note location and maintenance effort below.			X
5. Has all vegetation been removed? If applicable, note location of vegetation below	X		
6. Has usage of the site increase to a point that warrants a Pavement Condition Index (PCI) Survey?			X
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied?	X		

When was date of the last CPM treatment? 4/27/15 - 4/28/15
(Refer to Section 2.2.3 of the Operations & Maintenance Manual)

Additional descriptions of where repairs or maintenance is needed:

______

______

______

______

______

______

______

Inspector's Signature Sunil Sunnarco

05-22-2015 Cornell-Dubilier Electronics

Sunny, 60s

Site Inspection photos

Fence drive by inspection photos


25


TRUCK
ROUTE


25

Additional site photos

Los Alamos Technical Associates, Inc.
756 Park Meadow Road / Westerville, Ohio 43081 / (614) 508-1200 (phone) / (614) 508-1201 (fax) / www.lata.com

June 30, 2015

Mr. Patrick Nejand
Project Manager
US Army Corps of Engineers
New York District
214 State Highway 18
East Brunswick, NJ 08816

Mr. Ken Maas
Project Manager
US Army Corps of Engineers
Kansas City District
601 East 12th Street
Kansas City, Missouri 64106

SUBJECT: June 2015 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

Dear Messrs. Nejand and Maas:

Attached is the monthly report for June 2015 for the site inspection performed at the CDE site. This report details the activities completed as well as the inspection forms for the visit.

If you have any questions, please feel free call me at (614) 508-1200.

Sincerely,
LOS ALAMOS TECHNICAL ASSOCIATES, INC.

Nathan Canaris
Project Manager

Attachments

cc: File

TO: Patrick Nejand, Project Manager
Ken Mass, Project Manager
United States Army Corps of Engineers (USACE)

FROM: Nathan Canaris, Project Manager
Los Alamos Technical Associates, Inc. (LATA)

SUBJECT: June 2015 Inspection Report for the former Cornell Dubilier Electronics (CDE) Superfund Site, South Plainfield, New Jersey

LATA Project # 11266
Contract # W912DQ-09-D-3003,
Task Order # 0011

DATE: June 30, 2015

CURRENT ACTIVITIES

LATA's technician visited the Cornell Dubilier Electronics (CDE) Superfund Site for the regularly scheduled inspection visit on June 10, 2015 to perform the routine inspection of the facilities.

Work performed during the visit included; picked up trash from the fence line, inspected the catch basin and drainage basin system, inspected the perimeter fence, gates, etc., pulled woody vegetation from accessible areas of the drainage basin, downloaded the data from the basin dataloggers and performed a walking inspection of the asphalt cap areas. Copies of the inspection forms and photo documentation of the site visit are attached to this report.

One bag of trash (paper, plastic bottles, etc.) were picked up from around the fence line in various areas. The trash was disposed of in the local technician's office dumpster.

Attached with this report are preliminary drain time analyses for the surface sand filter using data from the barometrically compensated Solinst® level logger which was installed in the detention basin in September 2014. The precipitation data is provided by the USGS from a heated rain gauge located approximately five miles from the site in Middlesex, NJ.

MANPOWER REPORTING

Date	LATA Labor
June 10, 2015	Approx. 2.5 hrs.

OUTSTANDING ISSUES/RESOLUTIONS

None

PLANS FOR NEXT MONTH

Plans for the June 2015 visit includes inspection and general housekeeping activities and downloading the drainage basin level datalogger.

Site Inspection Forms
and
Photo Log

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection being Conducted X **Monthly**

Quarterly ______ **Annually** ______ **After 1" or Greater Rainfall** ______

Inspection Date: 6/10/2015 **Weather** Sunny, 70s

Inspectors Name Sunil Samaroo

Basin Inspection:

Catch Basins (23 Structures)

	Yes	No	N/A
1. Are catch basins properly draining?	X		
2. Are the catch basins clear of trash, sediment and debris?	X		
3. Has vegetation been removed from all catch basin areas?			X
4. Are there any signs of damage or deterioration of catch basins?		X	

If yes, which catch basin(s)? ______
(Refer to Record Drawings for catch basin numbers)

Stormwater Detention Basin and Surface Sand Filter:

	Yes	No	N/A
5. Does the basin have pooled or standing water?	X		

If yes, describe where **Water was observed in all 3 detention basins**
6. What is the water height **4 to 6 inches**
Approximately how many hours was the last rainfall? ______
How many inches of rain? ______

	Yes	No	N/A
7. Does the bottom appear relatively flat? No sand has washed away?	X		
8. Are concentrated flows of runoff being unexpectedly directed into the basin?		X	

If yes, describe where ______

	Yes	No	N/A
9. Is there any damage to the sand bed or berms?		X	
10. Has vegetation been removed from the basin areas?			X

Woody vegetation was removed by pulling/cutting at ground level around the top of the detention basins.

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inlet and Outlet Structures:

11. Are the five inlet and outlet structures draining properly?	X		
12. Is there any standing water? If yes, describe where ______		X	
13. Are the inlets clear of trash, sediment and debris?	X		
14. Are the outlets (standpipes, 3" Orifice, secondary outlet and emergency spillway) clear of trash, sediment, and debris?	X		
15. are there any signs of damage or deterioration of inlet/outlet structures? If yes, describe where ______		X	
16. Has vegetation been removed from inlet and outlets?			X

Additional descriptions of where repairs or maintenance is needed:

Subcontractors are on-site performing repairs to damaged areas in the asphalt.

Inspector's Signature

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: **6/10/2015** **Weather** **Sunny, 70s**

Inspectors Name **Sunil Samaroo**

"Tree Grove" Inspection

	Yes	No	N/A
1. Is there any tree damage from storms? If yes, describe:		X	
2. Is there an accumulation of tree debris? If yes, describe:		X	
3. Do any trees appear infested? If yes, describe:			X
4. Do any trees appear malnourished? If yes, describe:			X
5. Was the last Quarterly Seasonal Maintenance Performed? Date of previous maintenance: (Refer to section 2.3.2 of the Operation & Maintenance Manual)			X
6. Was the last Annual Arborist Inspection performed? Date of previous inspection: (Refer to section 2.3.3 of the Operation & Maintenance Manual)			X

Additional descriptions of where repairs or maintenance is needed:

Tree buffer being maintained "as is" by direction of USACE and EPA.

Inspector's Signature Sunil Samaroo

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Inspection Date: 6/10/2015 **Weather** Sunny, 70s

Inspectors Name Sunil Samaroo

Debris, Trash, Vegetation and Sediment Removal and Inspections
Comments

Removed trash from perimeter fence.
One bag of trash disposed of at URS dumpster.
Over all, the site remains in good condition.

General Housekeeping
Comments

Asphalt has minor cracking predominantly at seems, previously observed.
Subcontractors are on-site performing repairs to damaged areas in the asphalt.

Fencing and Gates
Comments

GOOD

Trash and Debris
Comments

(See above)

Snow Removal
Comments

N/A

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Pavement Inspection (Part of Annual Inspection)

	Yes	No	N/A
1. Is there any standing water? If yes, describe where ____________			X
2. Are there any signs of cracking? If so, note location and maintenance effort below.	X		
3. Are there any signs of disintegration? If so, note location and maintenance effort below.			X
4. Are there any sins of distortion? If so, note location and maintenance effort below.			X
5. Has all vegetation been removed? If applicable, note location of vegetation below	X		
6. Has usage of the site increase to a point that warrants a Pavement Condition Index (PCI) Survey?			X
7. Have any Critical Preventative Maintenance (CPM) Pavement Treatments been applied?			X

When was date of the last CPM treatment? ____________
(Refer to Section 2.2.3 of the Operations & Maintenance Manual)

Additional descriptions of where repairs or maintenance is needed:

Cracks in asphalt developing in the area of the water tower, previously observed.

Subcontractors are on-site performing repairs to damaged areas in the asphalt.

Inspector's Signature Sunil Sunnarco

Operation & Maintenance Inspection Form
Cornell-Dubilier Electronics Superfund Site
Operable Unit (OU-2)

Basin Drainage Rate Inspection:
(completed twice a year after a design rainfall event)

Date: ____________________

Design Rainfall Event Information
Requirements: 1.25" of rain in 2 hrs

Start: ____________________
Stop: ____________________
Inches of Rainfall: ____________________

Inspection Data
Start inspections 16 hours after design rain event
Perform subsequent inspection every 2 hours until height of water drops below the to of the aggregate in the middle basin

Inspection Run #	Target time from Event (hrs)	Actual Time	Water Height (ft)
1	16		
2	18		
3	20		
4	22		
5	24		
6	26		
7	28		
8	30		
9	32		
10	34		

Note approximate time water was drained below top of sand bed and compared to the normal drain time of 21 hrs.

____

____

____
Inspector's Signature

06-10-2015 Cornell-Dubilier Electronics

Site Inspection photos

Fence drive by inspection photos

Additional site photos

Preliminary Surface Sand Filter
Drain Time Analysis

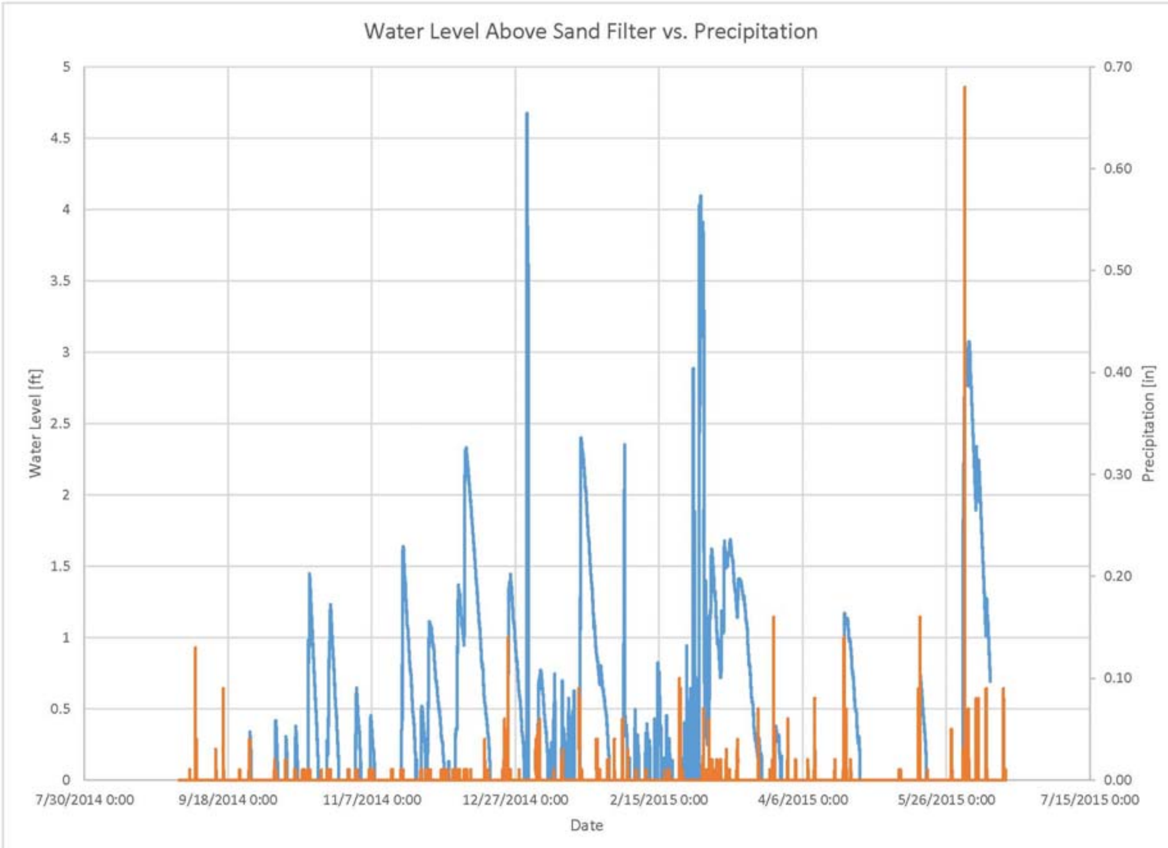


Figure 1. Timeseries of water level above the sand filter versus precipitation.

The full timeseries of water level above the sand filter versus precipitation measured at the rain gauge in Middlesex, NJ is presented in Figure 1. Individual precipitation events and their associated drainage times are presented below.

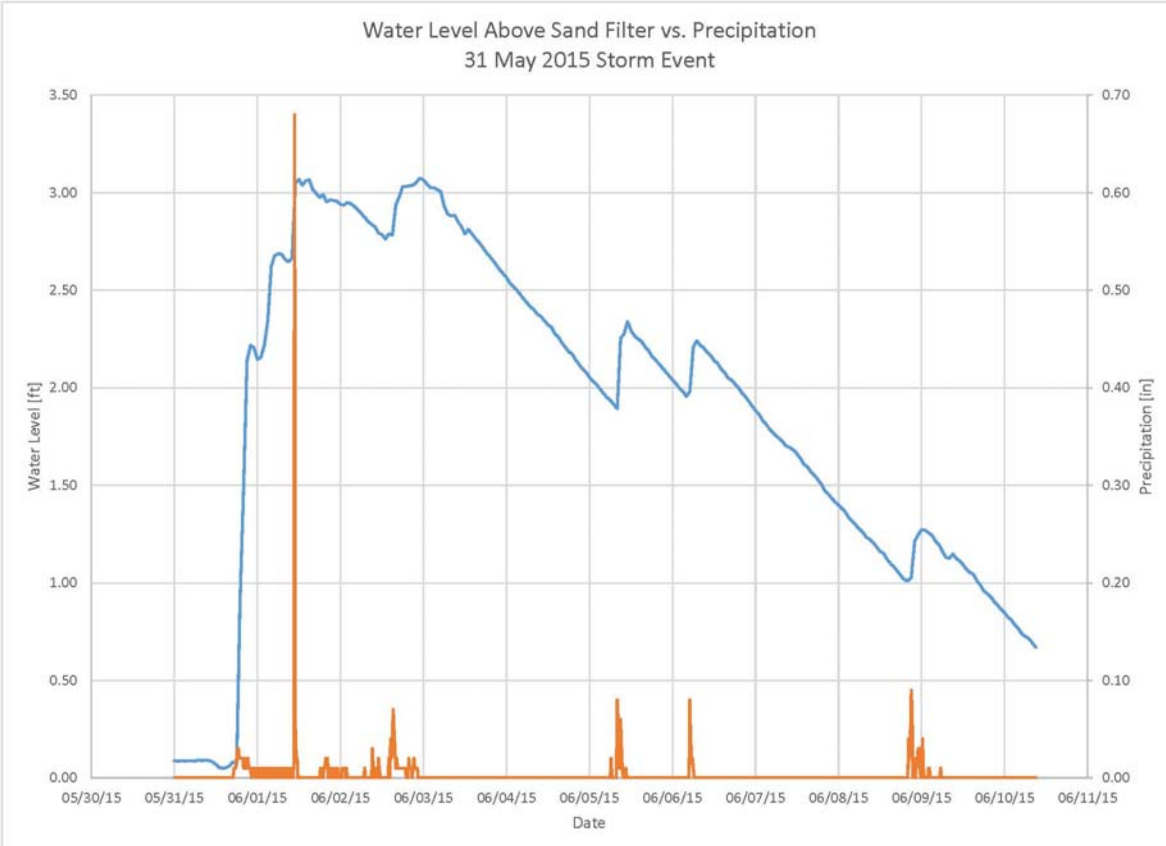


Figure 2. Sand filter drainage time for 31 May 2015 Storm Event.

During the period 31 May 2015 – 2 June 2015, the site received the largest amount of precipitation recorded since the pressure transducer was installed in the detention basin in September 2014. Figure 2 shows the water level above the sand filter along with precipitation data from the rain gauge in Middlesex, NJ. Twenty-four hour precipitation totals are listed below in Table 1.

Table 1. Twenty-four hour precipitation totals, 31 May 2015 – 2 June 2015

Date	Total Precipitation [in]
5/31/15	0.36
6/1/15	1.08
6/2/15	0.67

During this period, the highest rain rate recorded was 0.78 inches in a two hour period on 1 June. This is below the design storm event of 1.25 inches in a two hour period.

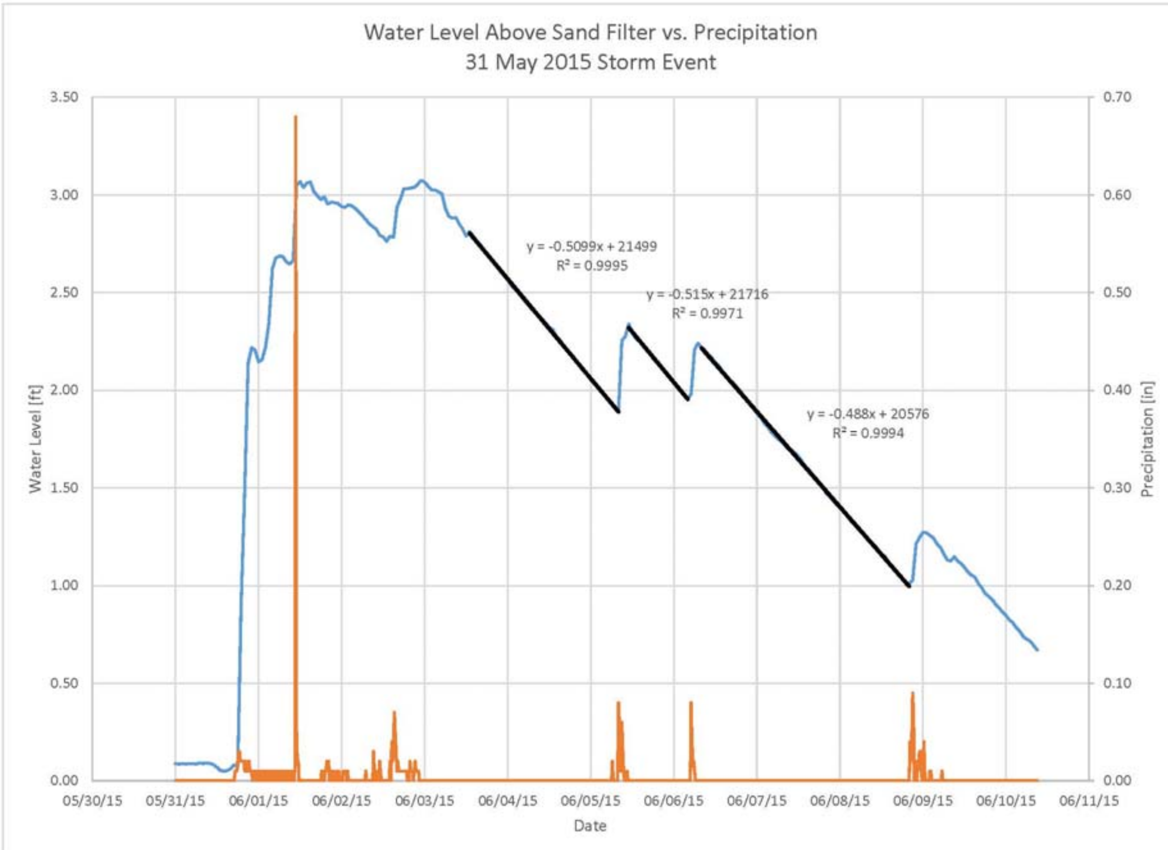


Figure 3. Sand filter drainage time for 31 May 2015 Storm Event with linear regressions during drainage.

Figure 3 includes three linear regressions fitted to the water level above the sand filter between precipitation events while the sand filter is draining. These regressions show that the sand filter has an average drain rate of approximately 0.5 ft/day.

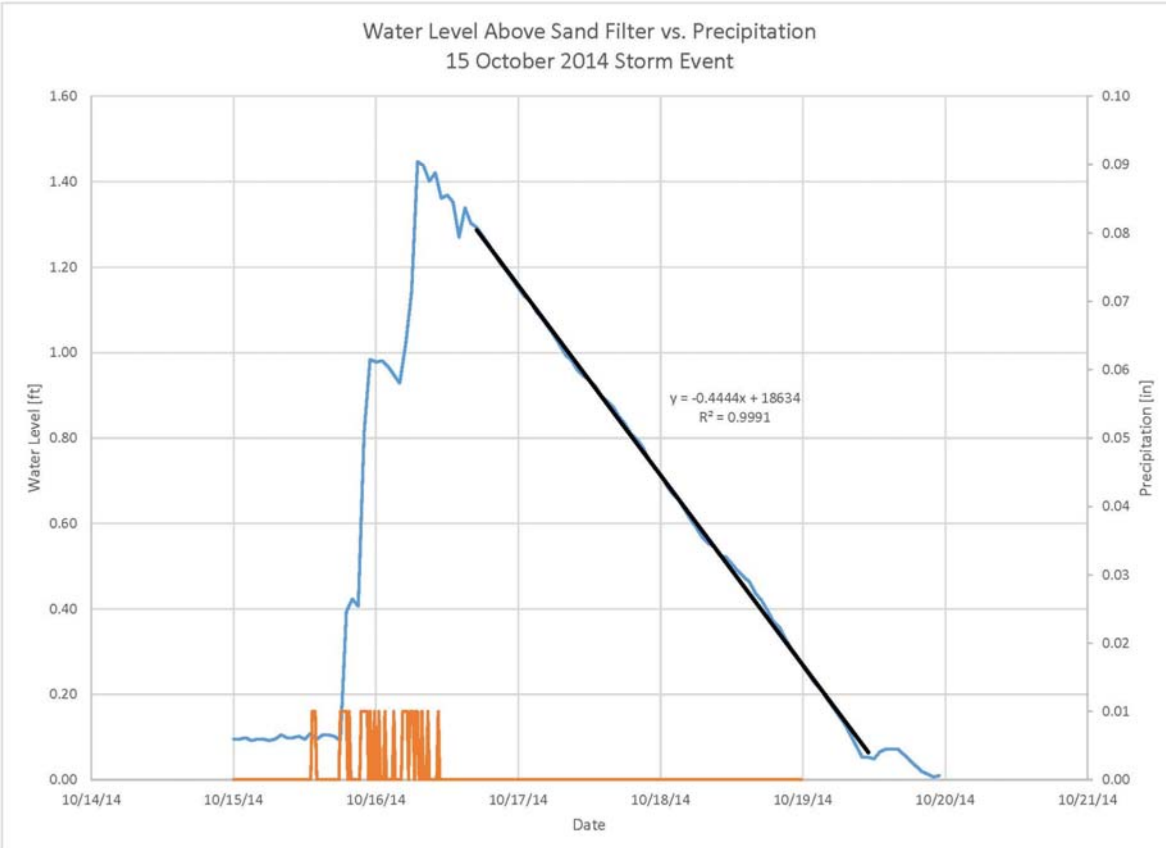


Figure 3. Sand filter drainage time for 15 October 2014 Storm Event with linear regression during drainage.

Figure 3 includes a linear regressions fitted to the water level above the sand filter after precipitation on 15-16 October while the sand filter is draining. This regression shows that the sand filter has an average drain rate of slightly less than 0.5 ft/day.

From the New Jersey Stormwater Best Management Practices Manual, Equation 9.9-1:

$$A_S = \frac{(V_{QS})(TH_S)}{[(k)(\frac{D_{ST}}{2} + TH_S)(T_D)]}$$

Equation 9.9-1

Where:
A_S = Minimum Sand Bed Surface Area (in square feet)
V_{QS} = Runoff Volume from the Stormwater Quality Design Storm (in cubic feet)
TH_S = Thickness of Sand in Sand Bed (in feet)
k = Sand Bed Design Permeability (in feet per day)
D_{ST} = Maximum Temporary Sand Bed Depth (in feet)
T_D = Sand Bed Drain Time (in days)

Solving for the Sand Bed Drain Time (T_D) and using the values and/or actual measurements below,
A_S = Minimum Sand Bed Surface Area = 9,660 ft^2
V_{QS} = Runoff Volume from the Stormwater Quality Design Storm = 82,621 ft^3
TH_S = Thickness of Sand in Sand Bed = 2 ft
k = Sand Bed Design Permeability = 4 ft/day
D_{ST} = Maximum Temporary Sand Bed Depth = 3.5 ft

T_D = .88 days or 21.1 hours

Equation 9.9-1 (Operation & Maintenance Plan, Cornell-Dubilier Electronics Superfund Site, Operable Unit 2, Appendix A) presents the design parameters for the sand bed from which it is calculated that runoff from the design storm event should drain in 21.1 hours.

Using data from the 31 May – 2 June precipitation event (Figures 1 and 2) the peak water level above the sand bed for this precipitation event was 3.07 feet at 2300 hours on 2 June 2015. Using the minimum sand bed surface area (A_s) from Equation 9.9-1, and multiplying by 3.07 feet this equates to approximately 29,656 ft^3 of water. Solving for T_D yields a sand bed drain time of 9.8 hours.

As shown in Figure 2, the sand bed had only drained down to a water level of 1.89 feet (net change of 1.18 feet) before the next precipitation event started at 0615 on 5 June 2015, with an average drainage rate of 0.5 feet per day.

This data suggests that the current permeability of the sand bed is significantly less than the design permeability of 4 ft/day.